

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

THE BOTANIC GARDENS LIST OF RARE AND THREATENED SPECIES

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, August 1984

A/N 14604

WCMC Report 84

UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES
INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

Commission du service de sauvegarde — Survival Service Commission
Comité des plantes menacées — Threatened Plants Committee
c/o Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 2.

THE BOTANIC GARDENS LIST OF MADAGASCAN SUCCULENTS

1980

FIRST DRAFT

COMPILED BY THE IUCN THREATENED PLANTS COMMITTEE SECRETARIAT
AT THE ROYAL BOTANIC GARDENS, KEW
FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

The TPC would like to express its warmest thanks to all the specialists, technical managers and curators who have contributed information.

KEW, October, 1980

Preface

Following the conferences on conservation held at the Royal Botanic Gardens, Kew in 1975 and 1978, much progress has been made both in drawing up lists of threatened plants and in collating the reports received from botanic gardens on their holdings.

The response to the list of European threatened species was very encouraging. The first draft of the holdings by botanic gardens was published in July 1979 and we hope to update it in the not too distant future.

Early in 1980 a list of Madagascan succulents was sent to all members of the Botanic Gardens Conservation Co-ordinating Body. So far we have received replies from 52 Botanic Gardens, of which 42 are holding material of the species on the list. From their replies we have compiled this report, on the lines of the European one. It first shows which gardens have material of Madagascan succulents and secondly lists the species in cultivation, showing for each plant the gardens in which it is being grown. At species level the totals are 235 cultivated out of 328 species on the original list.

We hope, of course, that those few garden members who have not yet responded will find time to reply so that we have eventually as complete a record as possible of those species in cultivation. This report will then be included in the proposed Botanic Gardens Green Book.

For the first time we include a new element of information not in the earlier report: this shows which gardens have indicated to us that they have material to spare of individual species on the list. The aim is that those members who would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

I am also pleased to announce that the Royal Botanic Gardens, Kew, will be pleased to propagate and distribute to other members on request any of the species on the list that they are holding (identified by the symbol K).

Gren Lucas
Secretary

Following the conference on conservation held at the Royal Botanic Gardens, Kew in 1975 and 1976, much progress has been made both in drawing up lists of threatened plants and in collecting the reports received from botanical gardens on their holdings.

The response to the list of European threatened species was very encouraging. The first draft of the holdings of botanical gardens was published in July 1978 and we hope to update it in the not too distant future.

Early in 1980 a list of Mediterranean succulents was sent to all members of the Botanic Gardens Conservation Co-ordinating body. So far we have received replies from 53 botanical gardens, of which 45 are holding material of the species on the list. From their replies we have compiled this report, on the lines of the European one. It first shows which gardens have material of Mediterranean succulents and secondly lists the species in cultivation, showing for each plant the gardens in which it is being grown. At species level the totals are 135 cultivated out of 179 species on the original list.

We hope, of course, that those few garden members who have not yet responded will find time to reply so that we have eventually a complete record as possible of those species in cultivation. This report will then be included in the proposed Botanic Gardens Green Book.

For the first time we include a new element of information not in the earlier reports: a list of individual species of plants which are held in botanical gardens. This is a list of individual species, not of genera or families. We hope this feature will be of assistance to those who are interested in the conservation of plants and helping their collection, and help remove pressure on wild collections.

I am also pleased to announce that the Royal Botanic Gardens, Kew, will be pleased to propagate and distribute to other members on request any of the species on the list that they are holding (identified by the symbol K).

Glen Lucas
Secretary

Introduction

This report is in two sections.

First is a list of the botanic gardens who hold material of the listed species, with their codes.

The second part is the list itself, giving the names of Madagascan succulent plants so far identified as in botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

Key

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case alone (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material the wild source code is used as, clearly, the wild source material is the more valuable.

I N D E X O F C O D E S

<u>CODE</u>	<u>INSTITUTION</u>
AMD	Hortus Botanicus, University of Amsterdam, Plantage Middenlaan 2, 1018DD, AMSTERDAM, The Netherlands.
B	Botanischer Garten & Botanisches Museum Berlin- Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BLAN	Jardin Botanico Marimurtra, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universitat, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
C	Botaniske Have, Københavns Universitet, Øster far- imagsgade 2B, DK-1353 KØBENHAVN K, Denmark.
CGG	University of Cambridge Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, England.
CHEL	Chelsea Physic Garden, 66 Royal Hospital Road, LONDON SW3 4HS, England.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Republic of Ireland.
DUSS	Botanischer Garten der Universitat Dusseldorf, Universitatstraas 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
GB	Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GÖTEBORG, Sweden.
GOET	Neuer Botanischer Garten der Universitat, Grisebachstrasse 1a, 3400 GOTTINGEN, Federal Republic of Germany.
HEID	Botanischer Garten der Universitat, Hofmeister- weg 4, HEIDELBERG, Federal Republic of Germany.
K	Royal Botanic Gardens, KEW, Richmond, Surrey, TW9 3AB, England. (Including Wakehurst Place).
KYM	University Botanical Gardens, Unioninkatu 44, 00170 HELSINKI 17, Finland.
LAU	Jardin Botanique de l'Universite et de la Ville de Lausanne, 14 bis Avenue de Cour, CH-1007 LAUSANNE, Switzerland.

LDS Botanical Experimental Garden, Department of
Plant Sciences, University of Leeds, LEEDS LS2 9JT,
England.

MO Missouri Botanical Garden, P.O. Box 299, ST LOUIS,
Missouri 63166, U.S.A.

MPU Jardin des Plantes de l'Universite de Montpellier,
163 Rue Auguste-Broussonnet, 34000 MONTPELLIER,
France.

NBG National Botanic Gardens of South Africa, Kirstenbosch,
Private Bag X7, CLAREMONT 7735, South Africa.

NEU Jardin Botanique, 11 Rue Emile-Argand, CH-2000
NEUCHÂTEL 7, Switzerland.

NIJ Botanic Garden, University of Nijmegen, Toernooiveld,
NIJMEGEN, The Netherlands.

NY New York Botanical Garden, Bronx, NEW YORK, 10458,
U.S.A.

ORT Jardin de Aclimatacion de la Orotava, Puerto de
la Cruz, TENERIFE, Canary Islands.

OULU Botanical Garden, University of Oulu, Box 191,
SF 90100 OULU 10, Finland.

PALZ Villa Taranto Botanic Gardens, 28048 VERBIANA
(Pallanza), Lago Maggiore, Italy.

PRE Pretoria National Botanic Garden, Privat Bag X107,
PRETORIA, South Africa.

PRU University of Pretoria Botanic Garden, PRETORIA
0002, South Africa.

RNG Botanic Garden, The University of Reading,
Whiteknights, READING RG6 2AS, England.

ROT Aboretum Trompenburg, Groene Wetering 46,
3002 PC ROTTERDAM, The Netherlands.

SBT Bergianska Tradgarden (Hortus Botanicus Bergianus),
P.O. Box 50017, 10405 STOCKHOLM 50, Sweden.

SDZO San Diego Zoological Gardens, Box 551, SAN DIEGO,
California 92112, U.S.A.

TEG Botanical Garden "Jochum-Hof", Maashoek 26, STEYL,
Gem. Tegelen, The Netherlands.

TRES	Tresco Abbey Gardens, TRESKO, Isles of Scilly, Cornwall, England.
U	University Botanical Garden, Transitorium 2, Heidelberglaan 2, 3508-TC UTRECHT, The Netherlands.
UPS	Botanical Garden of Uppsala, Villavagen 8, S-75236 UPPSALA, Sweden.
WAG	Belmonte Arboretum and Botanical Gardens, Generaal Foulkesweg 37, WAGENINGEN, The Netherlands.
WAHO	Institute for Horticultural Plant Breeding, P.O. Box 16, 15 Mansholtlaan, 6700AA, WAGENINGEN, The Netherlands.
WAI	Waimea Arboretum and Botanical Garden, 59-864 Kame- hameha Highway, HALEIWA, Hawaii 96712, U.S.A.
WSY	The Royal Horticultural Society's Garden, WISLEY, Woking, Surrey, GU23 6QB, England.
WTU	University of Washington Arboretum, SEATTLE, Washington 98195, U.S.A.
Z	Botanischer Garten der Universitat, Zollikerstrasse 107, CH-8008 ZURICH, Switzerland.
ZSS	Stadtische Sukkulentsammlung, Mythenquai 88, CH-8002 ZURICH, Switzerland.

SPECIES ON THE LIST OF MADAGASCAN SUCCULENTS THAT
ARE KNOWN TO BE CULTIVATED IN BOTANIC GARDENS

Botanic Gardens

APOCYNACEAE

Pachypodium baronii	boch, <u>HEID</u> , <u>PRE</u>
var. baronii	<u>HEID</u> , <u>RNG</u> , <u>PRE</u> , <u>ZSS</u>
var. windsori	b, boch, goet, <u>PRE</u> , <u>RNG</u> , <u>ZSS</u>
Pachypodium brevicaule	b, boch, <u>GOET</u> , <u>HEID</u> , <u>PRE</u> , <u>RNG</u> , <u>ZSS</u>
Pachypodium densiflorum	amd, <u>B</u> , boch, C, <u>HEID</u> , <u>K</u> , <u>PRE</u> , <u>TEG</u>
var. densiflorum	<u>RNG</u> , <u>ZSS</u>
Pachypodium geayi	amd, <u>B</u> , <u>BOCH</u> , C, goet, <u>HEID</u> , <u>K</u> , <u>MO</u> , <u>NY</u> , <u>PRE</u> , <u>PRU</u> , <u>RNG</u> , teg, <u>UPS</u> , <u>ZSS</u>
Pachypodium horombense	<u>B</u> , <u>BOCH</u> , C, goet, <u>HEID</u> , <u>PRE</u> , <u>RNG</u> , <u>ZSS</u>
Pachypodium lamerei	amd, <u>B</u> , <u>BLAN</u> , <u>BOCH</u> , C, goet, <u>HEID</u> , <u>K</u> , <u>PRE</u> , <u>ROT</u> , <u>SBT</u> , <u>SDZO</u> , teg, <u>UPS</u>
var. lamerei	<u>GB</u> , <u>HEID</u> , <u>PRE</u> +, <u>RNG</u> +, <u>Z</u> , <u>ZSS</u> +
var. ramosum	<u>B</u> , <u>HEID</u> , <u>PRE</u> , <u>SDZO</u> , <u>ZSS</u>
Pachypodium rosulatum	<u>BOCH</u> , <u>HEID</u> , <u>PRE</u>
var. rosulatum	<u>RNG</u> , <u>ZSS</u>
var. gracilius	<u>HEID</u> , <u>PRE</u> , <u>ZSS</u>
Pachypodium rutenbergianum	<u>BOCH</u> , C, <u>HEID</u> , <u>K</u> , <u>PRE</u> , <u>ZSS</u>

ASCLEPIADACEAE

Ceropegia albisepta	<u>PRE</u>
Ceropegia armandii	<u>HEID</u> , <u>RNG</u> +, <u>ZSS</u>
Ceropegia dimorpha	<u>PRE</u>
Ceropegia leroyi	<u>HEID</u> , <u>rng</u> +, <u>ZSS</u>
Ceropegia racemosa	<u>K</u>
Cynanchum compactum	<u>GOET</u> +
var. compactum	<u>ZSS</u>
Cynanchum descaisnianum	<u>PRE</u>

Cynanchum macrolobum	<u>PRE</u> , <u>UPS</u>
Cynanchum marnieranum	B, <u>BOCH</u> , C +, GOET, HEID, <u>PRE</u> , rng +, SDZO, zss
Cynanchum messeri	CGG
Cynanchum pachylobum	ZSS
Cynanchum perrieri	<u>B</u> , C +, <u>MO</u> , ZSS
Cynanchum pycneuroides	<u>HEID</u>
Cynanchum rauhianum	<u>PRE</u>
Cynanchum rossii	<u>HEID</u> , <u>PRE</u> +, ZSS
Folotsia floribunda	<u>PRE</u> , ZSS
Folotsia grandiflora	<u>HEID</u> , <u>PRE</u>
Folotsia sarcostemmatoides	<u>PRE</u>
Sarcostemma insigne	<u>UPS</u>
Sarcostemma madagascariense	duss
Stapelianthus decaryi	goet, <u>HEID</u> , <u>PRE</u> , SDZO, WAHO
Stapelianthus hardyi	boch, HEID, <u>PRE</u> +, ZSS
Stapelianthus insignis	CGG, GOET, <u>HEID</u> , <u>PRE</u> +, ZSS
Stapelianthus madagascariensis	<u>HEID</u> , PRE
Stapelianthus montagnacii	<u>HEID</u> , PRE
Stapelianthus pilosus	<u>B</u> , boch +, <u>HEID</u> , <u>PRE</u> , ZSS +
BALSAMINACEAE	
Impatiens tuberosa	<u>HEID</u> , ZSS
BOMBACACEAE	
Adansonia digitata	boch, <u>C</u> , goet, <u>K</u> , kym, lds, <u>NBG</u> , ort, oulu, SDZO, u, UPS
Adansonia fony	<u>PRE</u>
Adansonia madagascariensis	SDZO
BURSERACEAE	
Commiphora madagascariensis	<u>PRE</u>
CACTACEAE	
Rhipsalis baccifera	<u>C</u> +, GOET, <u>HEID</u> , <u>K</u> , MO, <u>NBG</u> , <u>NY</u> , <u>PRE</u> , ups, <u>WAG</u> +, <u>ZSS</u>

<i>Rhipsalis fasciculata</i>	cgg, DUSS, goet, <u>HEID</u> , <u>NY</u> , <u>ZSS</u>
<i>Rhipsalis horrida</i>	GOET, <u>HEID</u> , <u>NY</u>
COMPOSITAE	
<i>Senecio antandroi</i>	B, K, ZSS +
<i>Senecio boiteaui</i>	ZSS
<i>Senecio canaliculatus</i>	<u>HEID</u>
<i>Senecio cedrorum</i>	GB, HEID, ZSS
<i>Senecio crassissimus</i>	amd, b, C +, GB, GOET +, <u>HEID</u> , K, kym, NY, <u>PRE</u> , rng +, WAHO, ZSS +
<i>Senecio decaryi</i>	c +, HEID, rng +
<i>Senecio descoingsii</i>	C +, GB, <u>PRE</u> , rng +, ZSS
<i>Senecio hildebrandtii</i>	UPS
<i>Senecio longiflorus</i>	C +, goet, <u>K</u> , kym, <u>NBG</u>
var. <i>longiflorus</i>	MPU, ZSS +
var. <i>madagascariensis</i>	b, boch +, rng +, <u>UPS</u> , WAHO, ZSS +
<i>Senecio marnieri</i>	B
<i>Senecio mesembryanthemoides</i>	<u>HEID</u>
<i>Senecio meuselii</i>	C +, GOET, ZSS
<i>Senecio neohumbertii</i>	WAHO
CRASSULACEAE	
<i>Crassula cordifolia</i>	UPS, ZSS
<i>Crassula humbertii</i>	<u>PRE</u> , ZSS +
<i>Crassula micans</i>	b
<i>Kalanchoe ambolensis</i>	MO, WAG +
<i>Kalanchoe arborescens</i>	<u>B</u> , <u>HEID</u> , ups
<i>Kalanchoe aromatica</i>	B, HEID, WAG +, ZSS
<i>Kalanchoe beauverdii</i>	amd, <u>B</u> , C +, DBN, GB, goet +, ort, WAG +
var. <i>beauverdii</i>	ZSS

Kalanchoe beharensis	b, BLAN, boch, C +, CGG, chel +, DBN +, goet, HEID, <u>K</u> , kym, lau, NY, ort +, <u>PRE</u> , SDZO, teg, tres, UPS, WAG +, WAHO, wai, wsy, z
var. beharensis	GB, kym, OULU +, <u>PRE</u> , PRU, u, ZSS
var. aureo-aeneus	ZSS
var. subnuda	<u>PRE</u> , ZSS
Kalanchoe bitteri	B, ZSS
Kalanchoe blossfeldiana	BOCH +, C +, HEID, K, lds, NBG, ort SBT +, SDZO, teg, UPS, WAHO
Kalanchoe bracteata	<u>B</u> , <u>K</u>
Kalanchoe campanulata	amd, c +, WAG +, WAHO
var. campanulata	ZSS +
Kalanchoe diagremontiana	amd, blan +, boch, c +, cgg, DUSS, goet, HEID, K, kym, lds, ort, oulu, rng +, teg, u, UPS, <u>WAG</u> +, z, ZSS
Kalanchoe ebracteata	<u>HEID</u>
Kalanchoe eriophylla	c +, HEID, K, NY +, ort, WAG, WAHO, ZSS +
Kalanchoe fedtschenkoi	b, boch, c +, K, OULU +, <u>PRE</u> , SDZO, teg, UPS, WAG +, wai, WSY
var. fedtschenkoi	lds, ZSS
var. isalensis	HEID
Kalanchoe gastonis-bonnieri	B, DBN, <u>PRE</u> , WAG +, WAHO, ZSS
Kalanchoe globulifera	WAHO, ZSS +
Kalanchoe gracilipes	DUSS, <u>HEID</u> , SBT, WAG +, WAHO
Kalanchoe grandidieri	B, <u>PRE</u> , ZSS
Kalanchoe heckelii	HEID
Kalanchoe hildebrandtii	<u>B</u> , boch, C +, DBN, GB, K, MPU, ort, <u>PRE</u> , WAG +, WAHO, ZSS +
Kalanchoe integrifolia	<u>B</u> , GB, HEID, <u>K</u> , UPS, WAG +, WAHO, wsy, ZSS
Kalanchoe jongmansii	b, boch, C +, GOET, k, <u>PRE</u> , WAG +, WAHO
var. jongmansii	ZSS

Kalanchoe laxiflora	b, boch, c +, DBN +, <u>K</u> , ORT +, tres, WAG +, WAHO, ZSS +
var. laxiflora	GB
var. subpeltata	B
var. violacea	amd
Kalanchoe linearifolia	<u>K</u> , <u>PRE</u> , WAG +
Kalanchoe manginii	b, c +, DBN +, DUSS, GB, GOET, K, ORT +, <u>PRE</u> , rng, u, WAG +, WAHO, z, ZSS
Kalanchoe marnierana	B, BLAN, c +, DBN +, k, lau, teg, WAG +, WAHO, Z, ZSS
Kalanchoe millotii	<u>B</u> , boch +, C +, dbn +, goet +, K, <u>PRE</u> , rng +, u, WAG +, WAHO, ZSS +
Kalanchoe miniata	<u>B</u> , boch +, HEID, K, WAG +
var. miniata	zz +
var. sicaformis	B, wsy
Kalanchoe mortgagei	C, K, WAG +, ZSS
Kalanchoe nadyae	HEID
Kalanchoe orgyalis	b, BOCH +, C +, chel +, DBN, goet, <u>HEID</u> , k, NY, ort, <u>PRE</u> , SDZO, WAG +, ZSS
Kalanchoe peltata	<u>B</u> , NY, <u>PRE</u> , WAG +
var. peltata	<u>PRE</u> , ZSS
Kalanchoe poincarei	HEID
Kalanchoe porphyrocalyx	<u>B</u> , C +, <u>K</u> , RNG +, UPS, WAG +
Kalanchoe prolifera	amd, b, <u>K</u> , u, WAG +
Kalanchoe pubescens	<u>B</u> , C, neu, <u>PRE</u> , tres, WAG +
var. pubescens	<u>PRE</u> , ZSS
Kalanchoe pumila	amd, b, boch, C +, CGG, DUSS, GB, <u>HEID</u> , k, lau, ORT +, <u>PRE</u> , rng +, u, UPS, WAG +, WAHO, Z, ZSS
Kalanchoe rhombopilosa	<u>B</u> , boch, C +, GB, goet +, k, <u>PRE</u> rng +, teg, u, WAG +, WAHO, wsy, ZSS +
Kalanchoe rolandi-bonapartei	B

Kalanchoe rosei	<u>B</u> , boch, k
var. rosei	TRES, ZSS
Kalanchoe rubella	B, k, WAG +
Kalanchoe schizophylla	B, C +, DBN +, u, WAG +, ZSS +
Kalanchoe serrata	B, dbnt +, kym, wag, WAHO, z
Kalanchoe streptantha	B, k, WAG +, ZSS
Kalanchoe suarezensis	<u>PRE</u>
Kalanchoe synsepala	<u>B</u> , boch, <u>C</u> , DBN, <u>HEID</u> , MO, NY, WAG +, wsy, ZSS
Kalanchoe tetraphylla	DBN, <u>HEID</u> , K, <u>PRE</u> , WAG +, ZSS +
Kalanchoe tomentosa	amd, <u>B</u> , boch +, C, CGG, CHEL +, DBN +, GB, k, kym, lau, MO, MPU, ort, OULU, palz, <u>PRE</u> , rng, teg, u, ups, WAG +, WAHO, wsy, Z, ZSS
Kalanchoe trichantha	DBN +
Kalanchoe tubiflora	amd, b, boch +, C +, cgg, DUSS, goet, <u>HEID</u> , K, lds, OULU, PRU, rng +, u, <u>UPS</u> , WAG +, WAHO, wsy, Z, ZSS +
Kalanchoe uniflora	amd, b, boch, C, GB, goet, <u>HEID</u> , K, MPU, NIJ +, NY, rng +, UPS, wag, WAHO, wsy
var. uniflora	u, ZSS +
Kalanchoe viguieri	WAG +, ZSS
Kalanchoe waldheimii	amd, B, K, WAG +, ZSS

CUCURBITACEAE

Seyrigia bosseri	boch +, <u>HEID</u> , ZSS
Seyrigia gracilis	C +, <u>HEID</u> , OULU +, <u>PRE</u>
Seyrigia humbertii	B, C +, goet +, <u>HEID</u> , <u>PRE</u> , ZSS
Seyrigia multiflora	ZSS
Xerosicyos danguyi	<u>B</u> , boch +, C +, <u>CGG</u> , GB, <u>HEID</u> , NY, <u>PRE</u> , rng +, SDZO, u, ZSS +
Xerosicyos decaryi	<u>B</u> , cgg, CHEL +, <u>HEID</u> , <u>PRE</u> , rng, u, ZSS +

Xerosicyos perrieri

b, C +, DBN +, DUSS, goet +, HEID.
k, NY, OULU +, PRE, WAI, ZSS

DIDIEREACEAE

Alluaudia ascendens

B, boch, C, GOET, HEID, k, PRE, WAI

Alluaudia comosa

B, BOCH +, C, HEID, K, mo, PRE, WAI,
ZSS

Alluaudia dumosa

B, boch, C, GB, HEID, k, PRE, rng +,
SDZO, UPS, WAI, ZSS +

Alluaudia humbertii

amd, B, boch +, CGG, GOET, HEID, k,
kym, mo, PRE, rng +, u, UPS, WAHO,
WAI, ZSS

Alluadia montagnacii

B, HEID, K, PRE, WAI, ZSS

Alluaudia procera

amd, B +, BLAN, boch, C +, DUSS,
GB, GOET +, HEID, K, kym, NEU, PRE,
rng + SDZO, u, WAHO, WAI, z, ZSS

Alluaudiopsis fiherenensis

boch, HEID, PRE, WAI, ZSS

Alluaudiopsis marnierana

boch, HEID, PRE, zss

Decaryia madagascariensis

boch, GOET, HEID, k, PRE, rng +, WAI,
ZSS

Didierea madagascariensis

amd, B, boch, C, HEID, k, NY, PRE,
RNG +, WAI, ZSS

Didierea trollii

amd, B, BOCH +, C, CGG, goet, HEID,
k, NY, PRE, rng, WAI, wsy, Z, ZSS

EUPHORBIACEAE

Euphorbia alcicornis

GB, ROT, UPS

Euphorbia ankarensis

B, BOCH, goet, HEID, PRE, ZSS

Euphorbia beharensis

HEID, PRE, ZSS

Euphorbia bosseri

HEID, ZSS

Euphorbia cap-saintemariensis

BOCH, HEID, k, PRE

var. saintemariensis

PRE, ZSS

var. tulearensis

HEID, PRE

Euphorbia capuronii

DBN, HEID, MPU, ZSS

Euphorbia cylindrifolia

boch, HEID, k, PRE, rng +

ssp. cylindrifolia

C +, HEID, K, PRE, ZSS

ssp. tuberifera

HEID, ZSS

<i>Euphorbia decaryi</i>	<u>B</u> , boch, goet, K, <u>PRE</u> , ROT, <u>ZSS</u>
<i>Euphorbia delphinensis</i>	<u>HEID</u> , K, MPU, ROT, wsy, ZSS
<i>Euphorbia didieroides</i>	<u>C</u> , <u>HEID</u> , k, MPU, <u>PRE</u> , WAHO, ZSS
<i>Euphorbia duranii</i>	mpu
var. <i>duranii</i>	K, <u>ZSS</u>
<i>Euphorbia fianarantsoae</i>	MPU, <u>ZSS</u>
<i>Euphorbia fiherensis</i>	K, ZSS
<i>Euphorbia francoisii</i>	<u>B</u> , boch, <u>C</u> , <u>HEID</u> , <u>PRE</u> , rng +, WAHO, ZSS
<i>Euphorbia genoudiana</i>	<u>HEID</u> , rng +
<i>Euphorbia guillauminiana</i>	<u>HEID</u>
<i>Euphorbia guillemetii</i>	K, lds +, <u>PRE</u> , ZSS
<i>Euphorbia hedyotoides</i>	<u>HEID</u> , ZSS
<i>Euphorbia intisy</i>	<u>C</u> , <u>HEID</u> , WAHO
var. <i>intisy</i>	DBN +, ZSS
var. <i>maintyi</i>	DBN +
<i>Euphorbia laro</i>	k
<i>Euphorbia leandriana</i>	MPU
<i>Euphorbia leucodendron</i>	c, goet, <u>HEID</u> , WAHO, ZSS
<i>Euphorbia leuconeura</i>	amd +, B, CHEL +, NY, u, wag +, ZSS
<i>Euphorbia lophogona</i>	<u>B</u> , boch, CGG, GOET, <u>HEID</u> , <u>K</u> , MPU, NY, <u>PRE</u> , rng, ROT, u, UPS, WAHO, ZSS
<i>Euphorbia mangokyensis</i>	<u>PRE</u>
<i>Euphorbia milii</i>	blan, boch, <u>C</u> , CHEL +, DUSS, goet, <u>HEID</u> , kym, <u>MO</u> , nij +, NY, oulu +, rng +, wag, WAHO, wsy, Z
var. <i>milii</i>	amd, <u>C</u> +, GB, K, MPU, <u>PRE</u> , rng +, ZSS
var. <i>bevilaniensis</i>	ZSS
var. <i>bosseri</i>	<u>HEID</u>
var. <i>breonii</i>	GB, GOET, <u>HEID</u> , rng +, wsy, ZSS
var. <i>hislopil</i>	<u>C</u> +, DUSS, <u>HEID</u> , MPU, rng, ROT, teg, u, wag, ZSS
var. <i>imperatae</i>	MUP, wsy, ZSS

E

Euphorbia milii

- var. *longifolia* amd, HEID, ZSS
- var. *roseana* goet, ZSS
- var. *splendens* boch, c +, dbn +, HEID, k, lds, ROT, u, ups, wag, WAI, wt, ZSS
- var. *tananarivae* c +, MPU

Euphorbia millotii

BOCH, PRE, ZSS

Euphorbia moratii

HEID

Euphorbia neohumbertii

B, BOCH, GOET, HEID, PRE, rng

var. *neohumbertii*

HEID, ZSS

var. *aureo-viridiflora*

HEID

Euphorbia onoclada

B, dbn +, HEID, K, PRE, rng +, ROT, wsy, ZSS

Euphorbia orthoclada

C, PRE, rng +

Euphorbia pachypodioides

BOCH, HEID, PRE, ZSS

Euphorbia pauliana

HEID, MPU

Euphorbia pedilanthoides

PRE

Euphorbia plagiantha

HEID, ZSS

Euphorbia platyclada

b, boch +, C, HEID, ROT, ZSS

var. *platyclada*

HEID, K, PRE +

var. *hardyi*

HEID, PRE +

Euphorbia primulifolia

boch

Euphorbia quartzicola

PRE

Euphorbia ramipressa

b, boch, c +, DBN +, GB, K, kym, MPU, oulu +, rng +, SDZO, u, wag, wsy, z, ZSS

Euphorbia razafinjohanii

WAHO

Euphorbia rossii

HEID, ZSS

Euphorbia stenoclada

b, BOCH, C, HEID, K, PRE, ZSS

<i>Euphorbia viguieri</i>	<u>B</u> , boch, <u>C</u> , goet, <u>PRE</u> , teg, WAHO
var. <i>viguieri</i>	GB, <u>HEID</u> , <u>PRE</u> , ZSS
var. <i>ankarafantsiensis</i>	SDZO
var. <i>capuroniana</i>	K, ZSS
var. <i>tsimbazazae</i>	ZSS
<i>Euphorbia xylophylloides</i>	B, boch, c +, goet +, ROT, wsy, ZSS
GERANIACEAE	
<i>Pelargonium caylae</i>	CGG, HEID, pre, ZSS
LABIATAE	
<i>Coleus spicatus</i>	c +
LILIACEAE	
<i>Aloe acutissima</i>	b, C, K, <u>PRE</u> , RNG
var. <i>acutissima</i>	<u>K</u> , <u>PRE</u> , <u>PRU</u> , ZSS
var. <i>antanimorensis</i>	<u>B</u> , K, <u>PRE</u> , pru, SDZO, ZSS
<i>Aloe albiflora</i>	boch, C, HEID, K, NY, pre, rng +, SDZO, WAHO, <u>ZSS</u>
<i>Aloe andringitrensis</i>	C, <u>HEID</u>
<i>Aloe antandroi</i>	<u>HEID</u> , <u>K</u> , <u>PRE</u> , pru, <u>UPS</u> , <u>ZSS</u>
<i>Aloe bakeri</i>	b, c, DUSS, GB, goet +, <u>HEID</u> , <u>K</u> , <u>PRE</u> , pru, SDZO, WAHO, wsy, <u>ZSS</u>
<i>Aloe bellatula</i>	<u>B</u> , boch, <u>C</u> , <u>CGG</u> , DUSS, GB, <u>K</u> , <u>PRE</u> , SDZO, WAHO, ZSS +
<i>Aloe boiteau</i>	<u>HEID</u> , ZSS
<i>Aloe buchlohii</i>	<u>HEID</u> , <u>K</u> , <u>PRE</u> , pru, ZSS
<i>Aloe bulbillifera</i>	<u>B</u> , <u>HEID</u> , <u>K</u> , <u>PRE</u> , pru
var. <i>bulbillifera</i>	ZSS
var. <i>pauliana</i>	<u>PRE</u> , SDZO

<i>Aloe calcairophila</i>	b, <u>HEID</u> , <u>K</u> , <u>PRE</u> , WAHO, ZSS
<i>Aloe capitata</i>	b, boch, pru, WAHO
var. <i>capitata</i>	<u>PRE</u> , <u>ZSS</u>
var. <i>cipolinicola</i>	<u>PRE</u>
var. <i>gneissicola</i>	<u>PRE</u> +
var. <i>quartziticola</i>	<u>PRE</u>
<i>Aloe compressa</i>	k
var. <i>schistophila</i>	<u>PRE</u>
<i>Aloe conifera</i>	<u>PRE</u> , RNG, WAHO, <u>ZSS</u>
<i>Aloe contigua</i>	<u>PRE</u>
<i>Aloe cryptoflora</i>	<u>PRE</u>
<i>Aloe decaryi</i>	C, ZSS
<i>Aloe deltoideodonta</i>	B, boch, <u>HEID</u> , <u>K</u> , <u>UPS</u> , WAHO, wsy
var. <i>deltoideodonta</i>	pru, ZSS
var. <i>candicans</i>	<u>HEID</u> , <u>K</u> , <u>PRE</u> , <u>ZSS</u> +
<i>Aloe descoingsii</i>	boch +, C, <u>HEID</u> , <u>K</u> , lau, <u>PRE</u> , RNG +, SDZO, <u>ZSS</u>
<i>Aloe divaricata</i>	DBN, K, pru, SDZO
var. <i>divaricata</i>	<u>PRE</u>
<i>Aloe ericetorum</i>	<u>PRE</u>
<i>Aloe erythrophylla</i>	<u>PRE</u>
<i>Aloe fievetii</i>	<u>HEID</u> , <u>PRE</u> , ZSS
<i>Aloe haworthioides</i>	amd, boch, goet, <u>HEID</u> , K, MPU, rng, WAHO
var. <i>haworthioides</i>	<u>HEID</u> , SDZO, ZSS
var. <i>aurantica</i>	<u>PRE</u> , ZSS
<i>Aloe helenae</i>	<u>PRE</u>
<i>Aloe ibitiensis</i>	B, <u>K</u> , <u>PRE</u> , pru, WAHO
<i>Aloe imalotensis</i>	<u>UPS</u>

Aloe intermedia	<u>K</u> , <u>PRE</u> , pru
Aloe isaloensis	K, <u>PRE</u> , pru, ZSS
Aloe laeta	<u>PRE</u> , UPS
Aloe macroclada	ZSS
Aloe madecassa	
var. madecassa	ZSS
Aloe mayottensis	<u>K</u>
Aloe millotii	<u>B</u> , boch +, C, k, MO, <u>PRE</u> , pru, rng +, WAHO, <u>ZSS</u>
Aloe parallelifolia	b, <u>HEID</u> , <u>PRE</u> , ZSS
Aloe parvula	boch, C, goet, <u>HEID</u> , K, <u>PRE</u> , WAHO, z, ZSS
Aloe perrieri	goet +, rng +
Aloe rauhii	<u>B</u> , boch +, C +, DUSS, GB, <u>HEID</u> , K, pru, rng, WAHO, ZSS
Aloe schomeri	<u>HEID</u>
Aloe suarezensis	<u>B</u> , <u>HEID</u> , K, <u>PRE</u> , ZSS
Aloe suzannae	amd, B, <u>BOCH</u> , C, CGG, <u>HEID</u> , <u>K</u> , MO, MPU, <u>PRE</u> +, rng, ZSS
Aloe trachyticola	<u>PRE</u> , RNG
Aloe vaombe	b, BLAN +, <u>HEID</u> , pru, SDZO
var. vaombe	<u>PRE</u> +, ZSS
Aloe vaotsanda	<u>HEID</u> , ZSS
Aloe versicolor	<u>B</u> , <u>HEID</u> , <u>PRE</u> , pru, ZSS
Aloe viguieri	<u>B</u> , boch, <u>PRE</u> , ZSS
Lomatophyllum antsingyense	HEID
Lomatophyllum citreum	boch, DUSS, <u>PRE</u> , ZSS
Lomatophyllum macrum	amd, b, c +, heid, <u>K</u> , mo, <u>WAI</u> , ZSS
Lomatophyllum occidentale	K, <u>PRE</u>
Lomatophyllum orientale	HEID
Lomatophyllum prostratum	HEID, <u>K</u> , <u>PRE</u>

Lomatophyllum purpureum k, WAI

Sanseveria canaliculata c, DUSS, HEID, K, UPS, z, ZSS

MORINGACEAE

Moringa drouhardii PRE

Moringa hildebrandtii boch, HEID, ZSS

PASSIFLORACEAE

Adenia firlingalavensis HEID, PRE, ZSS

PEDALIACEAE

Uncarina abbreviata HEID

Uncarina decaryii HEID

Uncarina grandidieri PRE +, WAI

Uncarina leandrii PRE

Uncarina peltata PRE

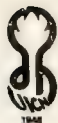
VITACEAE

Cissus quadrangularis b, boch, C, CGG, DBN +, goet, HEID, K,
lau, MPU, NBG, ny, ROT, SBT, TEG, u, wag,
WAHO, WAI, z, ZSS

Cyphostemma laxa

var. laxa ZSS

var. parviflora HEID, ZSS



UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES
INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

Commission du service de sauvegarde - Survival Service Commission
Comité des plantes menacées - Threatened Plants Committee
c/o Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

REPORT No. 3

THE BOTANIC GARDENS LIST OF CYCADS

INTERIM REPORT

COMPILED BY THE IUCN THREATENED PLANTS COMMITTEE SECRETARIAT

AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM BOTANIC GARDENS

AROUND THE WORLD

The TPC would like to express its warmest thanks to all the specialists, technical managers and curators who have contributed information to this report.

KEW, December 1980.

INTRODUCTION

This report presents the results of a survey by the TPC which preceded the setting up of the Botanic Gardens Conservation Co-ordinating Body and the initial results of which helped focus thinking on the role and work of the Body. The aim was to start with a relatively small group of known horticultural interest and long cultivated in botanic gardens, but also under increasing threat in the wild.

A letter was sent to botanic gardens asking simply if they could let us have a list of their cycad holdings (Families Cycadaceae, Stangeriaceae and Zamiaceae). The response was literally overwhelming and in part accounts for the relatively long delay in producing this report. Gardens from all over the world sent us lists long and short of their cycads. Many of the lists gave accurate information on the source of each plant - where it had been collected, by whom and when, or from which botanic garden it had been received. It was a most gratifying response which showed the great concern among garden managers for conservation and the desire to collaborate in a time-consuming scheme of this type. Our warm thanks to them all!

The lists received also highlighted the other delaying factor, the need for an agreed taxonomy of the group. Producing a list of 'accepted' cycad species world-wide proved probably the most difficult and intricate task so far undertaken by TPC! Not only are species concepts notoriously difficult, but there are many deep nomenclatural problems, especially with the Linnaean species. The standard reference is the monograph by J. Schuster in Engler's Das Pflanzenreich (Vol. IV. I, Leipzig, 1938), but its treatment of numerous varieties and subspecies from a few widespread taxa, especially in Cycas, is not followed by many recent authors in Floras. There is a clear trend towards treating Schuster's taxa below the species level as 'species' in their own right and this we have decided to follow. In general the Australian species follow L.A.S. Johnson, 'The Families of Cycads and the Zamiaceae of Australia', Proc. Linn. Soc. N.S.W. 84: 64-117 (1969), and the southern African species R.A. Dyer and I.C. Verdoorn in the 'Flora of Southern Africa (Eds. L.E. Codd et al.), volume I (1966), with a few more recent additions in both cases.

The full list of 'species' is issued as a separate document on sheets with columns for annotation with up-to-date garden holdings. The list is obviously incomplete and in need of further taxonomic refinement. The treatment of Cycas, in particular, must await a comprehensive revision of the genus; the problem of C. circinalis and C. rumphii is particularly acute as their ranges appear to overlap extensively. The West Indian cycads are the subject of great nomenclatural difficulties; in the interim we are following a manuscript kindly sent to us by Dr R.W. Read at the Smithsonian Institution; because of the problem of typification, the well-known Jamaican species is presently listed as Zamia sp.

We emphasize that the list is not the result of any monographic studies at the Royal Botanic Gardens, Kew, but is the result of a careful literature survey by TPC staff with the help of botanical friends and colleagues wherever possible throughout the world. We would greatly appreciate comments from experts for a later edition, and also information on the conservation status in the wild of those many species presently listed as Insufficiently Known (K). The compilation was undertaken by Hugh Synge and Sara Oldfield; the botanic garden records were collated by Rebecca Stewart and Winifred Worth.

The list which follows covers only species identified in botanic gardens. Beside each species are the codes of those gardens who are reported to be holding live material of that species. Where male or female plants were recorded, this is shown, but it should be remembered that not all the plants in that holding may be of the sex indicated. The codes used follow 'Index Herbariorum'; for gardens without an herbarium, codes have been created and agreed with IAPT. An index of the codes used with full address of the gardens is also provided; an asterisk by the code in this section indicates that the abbreviation is not yet agreed with IAPT.

Fitting the names on the garden lists we received into our list of 'accepted species' proved difficult and so gardens who collaborated are being asked separately to confirm the records ascribed to them. Meanwhile TPC is looking into the next step of utilizing and presenting the locality and records data supplied by many gardens. One further proposal is to create a cycad pollen-bank. We would greatly welcome your suggestions on this and other ideas and would be most interested to hear from you what sort of additional information about the garden holdings would be useful to you in your work. We trust that this present report will be a source of valuable information to curators of gardens in planning their live collections and will contribute to reducing collecting pressure of wild species; we are glad to report that many of these species are now protected in their native habitats.

The data from this report and the updated version which we hope to produce in due course will be incorporated into the TPC Green Book, which will integrate together all the Botanic Gardens Reports produced so far.

Gren Lucas
Secretary
Threatened Plants Committee

BOTANIC GARDEN CODES

AMD	Hortus Botanicus, University of Amsterdam, Plantage Middenlaan 2, 1018DD, AMSTERDAM, The Netherlands.
AWH	The Botanic Garden, ANTWERP, Belgium.
B	Botanischer Garten and Botanisches Museum Berlin-Dahlem, Königin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BAJ	Jardin Botanico 'Carlos Thays', Instituto Municipal de Botania, Avenida Santa Fe 3951, BUENOS AIRES.
BKF	The Forest Herbarium, Royal Forest Department, BANGKOK 9, Thailand.
BO	Botanic Gardens of Indonesia, Kebun Raya, P.O. Box 110, BOGOR, Java, Indonesia.
*BO (C)	Botanic Gardens Cibodas, Sindanglaya, West Java, Indonesia.
*BO (P)	Botanic Garden Purwodadi, Lawang, East Java, Indonesia.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 2148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
BSI	Botanical Survey of India (Western Circle), Poona - see CAL.
C	Botaniske Have, Københavens Universitet, Øster Farimagsgade 2B, DK-1353, KØBENHAVEN, Denmark.
CAL	Botanical Survey of India, Botanic Garden, Sibpore, Howrah-3, CALCUTTA, India. See also: MH Coimbatore: Southern Circle BSI Poona: Western Circle
CBG	National Botanic Gardens, Canberra, A.C.T. 2601, Australia.

*CED Jardin Botanique 'Les Cèdres',
06290 SAINT-JEAN-CAP-FERRAT, Alpes Maritimes,
France.

CGG University Botanic Garden, 1 Brookside,
CAMBRIDGE CB2 1JF, England.

CHRC Botanic Gardens, Parks and Reserves,
City Council, P.O. Box 237, CHRISTCHURCH,
New Zealand.

DAV Botany Department, University of California,
DAVIS, California 95616, U.S.A.

DBN National Botanic Gardens, Glasnevin, DUBLIN 9,
Republic of Ireland.

E Royal Botanic Garden, EDINBURGH EH3 5LR,
Scotland.

FTG Fairchild Tropical Garden, 10901 Old Cutler
Road, MIAMI, Florida 33156, U.S.A.

G Conservatoire et Jardin Botaniques, Case Postale 21,
CH-1211, GENEVA, Switzerland.

GOET Neuer Botanischer Garten der Universität,
Grisebachstrasse 1a, D-3400 GOTTINGEN, Federal
Republic of Germany.

GRO Hortus de Wolf, Kerklaan 30, HAREN, Groningen,
The Netherlands.

HBG Botanischer Garten, Institut für Allgemeine Botanik,
Jungiusstrasse 6, HAMBURG 36, Federal Republic of
Germany.

HK Hong Kong Zoological and Botanic Gardens, Agriculture and
Fisheries Department, 393 Canton Road 12F, KOWLOON,
Hong Kong.

HNT Huntington Botanical Gardens, 1151 Oxford Road,
SAN MARINO, California 91108, U.S.A.

*HONBG Honolulu Botanic Gardens, Department of Parks and
Recreation, 50N Vineyard Boulevard, HONOLULU,
Hawaii 96817, U.S.A. (Data refer to plants in the
Foster Botanic Garden).

K Royal Botanic Gardens, KEW, Richmond, Surrey
TW9 3AB, England.

MJG Botanischer Garten der Johannes Gutenberg-Universität,
Saarstrasse 21, 6500 MAINZ, Federal Republic of Germany.

MO Missouri Botanical Garden, 2315 Tower Grove
Avenue, ST LOUIS, Missouri 63110, U.S.A.

MSTR Botanischer Garten der Westfälische Wilhelms-Universität,
Schlossgarten 3, 44 MUNSTER, Federal Republic of Germany.

NAP Istituto di Botanica Generale e Sistematica,
Universita' Di Napoli, 1 80055 PORTICI, Italy.

NBG National Botanic Gardens of South Africa,
Kirstenbosch, Newlands 7725, CAPE TOWN, South Africa.

NY New York Botanical Garden, Bronx, NEW YORK 10458,
U.S.A.

O University Botanical Garden, Trondheimsvn. 23B,
OSLO 5, Norway.

PC Muséum National d'Histoire Naturelle, Service
des Cultures, 43 Rue Buffon, PARIS Ve, France.

*PCPT Phipps Conservatory, Schenley Park, PITTSBURGH,
Pennsylvania 15213, U.S.A.

PO Instituto de Botânica 'De Gonçalo Sampaio'
Universidade do Porto, Rua do Campo Alegre,
1191 PORTO, Portugal.

PRE Botanical Garden, Botanical Research Institute,
Private Bag X101, PRETORIA 0001, South Africa.

PRU University Botanic Garden, 0002 PRETORIA,
South Africa.

SBT Bergianska Trädgården (Hortus Botanicus
Bergianus), P.O. Box 50017, 10405 STOCKHOLM 50,
Sweden.

SING Botanic Gardens, Cluny Road, SINGAPORE 10,
Republic of Singapore.

*SLEG Ewanrigg Botanical Garden, P.O. Box 8119, Causeway,
SALISBURY, Zimbabwe.

SRGH National Botanic Garden, P.O. Box 8100, Causeway,
SALISBURY, Zimbabwe.

STA University Botanic Gardens, St ANDREWS, Fife, Scotland.

KLU	Rimba Ilmu Botanic Gardens, University of Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia.
*KPBG	Kings Park and Botanic Garden, West Perth, Western Australia 6005.
KRA	Hortus Botanicus Universitatis Jagellonicae, Kopernika 27, KRAKOW, Poland.
KUU	University Botanic Garden, KUMASI, Ghana.
LAE	National Botanic Garden, P.O. Box 314, LAE, Papua New Guinea.
LATT	Giardino Botanico Hanbury, La Mortola, Ventimiglia, 18036 LATTE, Italy.
LD	University Botanic Garden, Ö Vallgatan 18, S-223 61 LUND, Sweden.
LE	Botanical Garden of the Komarov Botanical Institute, Prof. Popov Street 2, 197022 LENINGRAD P-22, U.S.S.R.
LIM	Severočeská Botanická Zahrada, Purkyňova 3, LIBEREC, Czechoslovakia.
LISC	Jardim e Museu Agrícola do Ultramar, Rua Jua 54, LISBON 3, Portugal.
LY	Jardin Botanique de la Ville de Lyon, Parc de la Tête d'Or, LYON 6me, Rhône, France.
M	Botanischer Garten München-Nymphenburg, Menzingerstrasse 63, 8000 MUNICH, Federal Republic of Germany.
MA	Jardin Botanico, Instituto Botanico 'Antonio José Cavanilles', Plaza de Murillo 2, MADRID 14, Spain.
MEXU	Jardin Botanico del Instituto de Biologia, Universidad Nacional Autonoma de Mexico, Ap. Postal 70-268, MEXICO 20 DF, Mexico.
MH	Botanical Survey of India (Southern Circle), Coimbatore - see CAL.
MICH	Matthaei Botanical Gardens, 1800 Dixboro Road, ANN ARBOR, Michigan 48105, U.S.A.

TAIF Botanical Garden, Taiwan Forestry Research Institute,
53 Nan-Hai Road, TAIPEI, Taiwan.

TUR Botanical Garden, University of Turku,
SF-20500 TURKU 50, Finland.

U University Botanical Gardens, Transitorium 2, Hedel-
berglaan 2, 3508 TC-UTRECHT, The Netherlands.

UC Botanical Garden, Department of Botany, University of Cali-
fornia, BERKELEY, California 94720, U.S.A.

UCI University Botanical Garden, IBADAN, Oyo State, Nigeria.

UCR Riverside Botanic Gardens, University of California,
RIVERSIDE, California 92506, U.S.A.

UPS University Botanical Garden, Villavägen 8, S-752 36
UPPSALA, Sweden.

WA University Botanical Garden, Al Ujazdowskie 4, 00-478 WARSAW,
Poland.

WAI Waimea Arboretum, 59-864 Kamehameha Highway, HALEIWA,
Hawaii 96712, U.S.A.

WU Botanisches Institut und Botanischer Garten der Universität,
Rennweg 14, A-1030 VIENNA, Austria.

Z Botanischer Garten der Universität, Zollikerstrasse 107,
CH-8008 ZÜRICH, Switzerland.

ZARIA Department of Biological Sciences, University,
ZARIA, North Central State, Nigeria.

CYCAD HOLDINGS OF BOTANIC GARDENS

Botanic Gardens

CYCADACEAE

<i>Cycas angulata</i>	HONBG
<i>Cycas armstrongii</i>	KPBG
<i>Cycas beddomei</i>	MH
<i>Cycas cairnsiana</i>	DAV, FTG♂, HNT, HONBG, SLEG, WAI
<i>Cycas circinalis</i>	AMD♀, B, BSI, C, CED, CGG, EQ, FTG♀♂, GOET, GRO♀, HONBG K♀, KRA♂, LAE, LD♀♂, LE, LISC, LY♀♂, M, MH, MJG, MO, MSTR, NAP♀, O, PC, PO, PRU, SBT, STA♂, TUR, U, UCR, UPS, WA♀, WAI, WU, Z, ZARIA
<i>Cycas kennedyana</i>	HONBG, LAE
<i>Cycas media</i>	AMD, BOCH, CBG, CED, DAV, E, FTG♂, G, HK, HNT, HONBG, K, KPBG, LAE, LD, LE, O, PC, PCPT, SBT, SLEG, TUR, WA
<i>Cycas micholitzii</i>	DBN
var. <i>simplicipinna</i>	BKF
<i>Cycas normanbyana</i>	SLEG
<i>Cycas pectinata</i>	BKF, CED, FTG, HONBG, K, SLEG
<i>Cycas revoluta</i>	AMD♀, AWH, B, BAJ, BO, BO(C), BOCH, BR, C, CAL, CED, CGG, CHRC, DAV♀♂, DBN, E, FTG♀♂, G, GOET, GRO, HBG, HK, HNT, HONBG, K♀, KLU, KRA♀, LAE, LAT♀♂, LD, LE, LIM, LISC, LY, M, MH, MICH, MJG, MO, MSTR, NAP♀♂, NY, O, PC, PCPT, PO, PRE, PRU, SBT, SING, SLEG♀♂, STA♂, TAIF, TUR, U, UC, UCR, UPS, WA, WAI, WU, Z
<i>Cycas rumphii</i>	AMD♀, BKF, BO, BO(C), BO(P), BR, CAL, CED, E, FTG♀♂, HNT, HONBG, K, KLU, LAE, LE, LIM, MICH, O, PC, SING, SLEG, TAIF, UCR, UPS, WAI
<i>Cycas siamensis</i>	BKF, CED, DAV, FTG, HK, HONBG, K♀, M, SING, SLEG, UC

<i>Cycas taiwaniana</i>	DAV, HNT, TAIF, U
<i>Cycas thouarsii</i>	AMD, B, CED, DBN, FTG, K♀, KUUF♂, M, MSTR, PC, PRE, SLEG♀, SRGH, STA, TAIF, UC
<i>Cycas wadei</i>	E, HNT
STANGERIACEAE	
<i>Stangeria eriopus</i>	AMD♂, B, BR, C, CED, CGG, DAV♀, DBN, E♀♂, FTG♀♂, GOET, GRO♂, HBG, HNT, K♂, KPBG, KRA♀♂, LE, LY, M, MJG, MO, MSTR, NBG, PC, PRE, PRU, SLEG, STA♀, TUR, U, UC, UCR, WA♀♂, Z
ZAMIACEAE	
<i>Bowenia serrulata</i>	CBG, CED, DAV, FTG, HNT, HONBG, K, LE, SLEG, TUR, UC, UCR
<i>Bowenia spectabilis</i>	AMD, BO, C, CED, FTG, G, HONBG, K, KPBG, M, SLEG, UCR
<i>Ceratozamia kuesteriana</i>	CED, DBN, HNT, HONBG, K, SLEG, STA
<i>Ceratozamia latifolia</i>	HONBG, SLEG♀
<i>Ceratozamia matudae</i>	CED
<i>Ceratozamia mexicana</i>	AMD♀♂, AWH, B, BR, CED, CGG, DAV♀♂, DBN, E♀, FTG♀♂, GRO♀♂, HBG♀, HNT, HONBG, K♀♂, KRA♂, LD, LE, LY♀♂, M, MA♀, MEXU, MICH, MJG, MO, MSTR, NAP, O, PC, PCPT, SBT♀, SLEG♀, U♂, UC, UPS, WA♀, WU, Z♂
<i>Ceratozamia miqueliana</i>	HNT, HONBG, K, MEXU, Z
<i>Ceratozamia zaragozae</i>	CED, K♂, SLEG, UC
<i>Dioon dohenyi</i>	HNT
<i>Dioon edule</i>	AMD, B, BO, BR, C, CAL, CED, CGG, DAV♀♂, DBN, E, FTG, G, GRO♀, HBG, HNT, HONBG, K♂, KRA♂, LATT♀, LD♂, LIM, LY, M, MEXU, MICH♂, MJG, MO, MSTR, NAP♀, O, PRE, PRU, SLEG♀♂, TUR, U, UC, UCR, UPS, WU, Z
<i>Dioon mejiae</i>	K
<i>Dioon purpusii</i>	CED, DAV, FTG, HNT, HONBG, K♀♂, NAP, SLEG

<i>Dioon spinulosum</i>	AMD, B, CED, DAV, DBN, E, FTG♀♂, GOET, HBG, HNT, HONBG, K♀, M, MEXU, MICH, MO, MSTR, NY, PRE, SLEG
<i>Encephalartos altensteinii</i>	AMD♀♂, AWH, B, BO(C), BR, CED, CGG, E♂, FTG, GOET, HBG, HNT, HONBG, K, LAT♂, LE, MICH, MJG, MO, MSTR, NAP♂, NBG, PRE, PRU, SLEG♂, STA, U, UC, UCR♂, Z♂
<i>Encephalartos arenarius</i>	FTG, HNT, HONBG, NBG, PRE, PRU, SLEG
<i>Encephalartos barteri</i>	C, CED, CGG, FTG, HNT, HONBG, K, KUU, PRE, SRGH, STA, UCI♂, ZARIA
<i>Encephalartos bubalinus</i>	CED, CGG, E, FTG, K, NAP, PC, SLEG
<i>Encephalartos caffer</i>	B, BR, CED, DBN, FTG, HONBG, NBG, O, PRE, PRU, SLEG♂
<i>Encephalartos chimanimaniensis</i>	CED, PRE, SLEG♂, SRGH
<i>Encephalartos concinnus</i>	FTG, HONBG, NAP, SLEG♂, SRGH
<i>Encephalartos cupidus</i>	FTG, NBG, PRE, PRU, SLEG
<i>Encephalartos cycadifolius</i>	B, BR, CED, HNT, M, NBG, PC, PRE, PRU, SBT, SLEG
<i>Encephalartos eugene-maraisii</i>	CED, FTG, HONBG, K, NBG, PRE, PRU, SLEG♀, UC
<i>Encephalartos ferox</i>	AMD, CED, DAV, E, FTG♀♂, HBG, HNT, HONBG, K♀♂, LD, M, MO, NBG, PRE, PRU, SLEG♀♂, UC, UCR, WA
<i>Encephalartos friderici-guilielmi</i>	CED, FTG, HNT, HONBG, MICH, NBG, PRE, PRU, SLEG♂
<i>Encephalartos ghellinckii</i>	FTG, HNT, HONBG, NBG, PRE, PRU, SLEG♀♂
<i>Encephalartos gratus</i>	C, CED, CGG, FTG, HNT, HONBG, K, KPBG, NAP, PRE, SLEG♀, SRGH, UC
<i>Encephalartos heenanii</i>	NBG, PRE, PRU
<i>Encephalartos hildebrandtii</i>	BO, CED, DBN, E♂, HONBG, M, MO, NAP, PRE, PRU
<i>var. hildebrandtii</i>	BAJ, FTG, k♀
<i>var. dentatus</i>	FTG♂, K, SLEG
<i>Encephalartos horridus</i>	AMD, B, BAJ, BO, BO(C), BR, CED, FTG♂, GRO, HNT, HONBG, K, KRA♂, LAT, LY♀, M, MA, MJG, MO, MSTR, NAP, NBG, O, PCPT, PRE, PRU, SLEG♂, U, WU, Z

<i>Encephalartos humilis</i>	CED, HNT, HONBG, NAP, NBG, PRE, PRU, SLEG♂, UC
<i>Encephalartos inopinus</i>	CED, FTG, HONBG, NBG, PRE, PRU, SLEG
<i>Encephalartos laevifolius</i>	NBG, PRE, PRU, SLEG♀♂
<i>Encephalartos lanatus</i>	CED, FTG, HNT, HONBG, MO, NAP, NBG, PRE, PRU, SLEG♂
<i>Encephalartos latifrons</i>	CED, FTG, HBG, K, NBG, PC, PRE, PRU, SLEG♀
<i>Encephalartos laurentianus</i>	BO, BR, CED, CGG, FTG♂, HNT, M, NAP
<i>Encephalartos lebomboensis</i>	AMD, CED, DAV, E, FTG, HNT, HONBG, K, M, NBG, PC, PRE, PRU, SLEG♀, UC, WA
<i>Encephalartos lehmannii</i>	AMD♂, B, BAJ, BR, C, CED, CGG, DBN, E, FTG, HBG, HNT, HONBG, K, LAT♂, LY, M, NBG, PC, PRE, PRU, SLEG♂, STA, Z
<i>Encephalartos longifolius</i>	BAJ, CED, FTG, HBG, HNT, HONBG, K, KRA♂, LY, MO, NBG, PRE, PRU, SLEG♂
<i>Encephalartos manikensis</i>	C, CED, FTG♂, HNT, HONBG, K, M, NAP, PRE, SLEG♂♂, SRGH
<i>Encephalartos munchii</i>	CED, FTG, HONBG, NAP, PRE, SLEG♀♂, SRGH
<i>Encephalartos natalensis</i>	CED, E♀♂, FTG♀, HONBG, K♀♂, NBG, PRE, PRU, SLEG, UC
<i>Encephalartos ngoyanus</i>	CED, HNT, HONBG, NBG, PRE, PRU, SLEG
<i>Encephalartos paucidentatus</i>	FTG, HNT, HONBG, NAP, NBG, PRE, PRU, SLEG♀
<i>Encephalartos poggei</i>	CED, SLEG♀
<i>Encephalartos princeps</i>	CED, FTG, HNT, HONBG, NBG, PRE, PRU, SLEG♂, UC
<i>Encephalartos pterogonus</i>	C, CED, PRE, SLEG
<i>Encephalartos septentrionalis</i>	BR, CED, FTG, HNT, K, PC, SLEG, STA
<i>Encephalartos tegulaneus</i>	CED, FTG, HNT, K, SLEG, U
<i>Encephalartos transvenosus</i>	B, CED, E, FTG, HNT, HONBG, K, M, MJG, MO, MSTR, NBG, PC, PRE, PRU, SLEG♀♂
<i>Encephalartos trispinosus</i>	BR, CED, FTG, HONBG, K, LE, NBG, PRE, PRU, SLEG♀

<i>Encephalartos umbeluziensis</i>	CED, FTG, HNT, K, NBG, PC, PRE, PRU, SLEG
<i>Encephalartos villosus</i>	AMD, B, BAJ, BO, BR, C, CAL, CED, DBN, E♀, FTG, GOET, HNT, HONBG, K♂, M, MICH, NBG, NY, PC, PRE, PRU, SING, SLEG♂, U♀, Z♂
<i>Encephalartos woodii</i>	CED, DBN, FTG, HONBG, K♂, NBG, PRE, PRU, SLEG♂
<i>Lepidozamia hopei</i>	AMD, BO, CBG, CED, FTG, HONBG, K, LAE
<i>Lepidozamia peroffskyana</i>	AMD♀, BO, BOCH, BR, CBG, CED, CHRC, DAV, DBN, E♀, FTG, HBG, HNT, HONBG, K♂, LE, M, PC, SBT, SLEG, STA, UC, UCR
<i>Macrozamia communis</i>	AMD, B, BOCH, BR, C, CBG, CED, CGG, E, FTG♂, HBG, HNT, HONBG, KPBG, LE, LY, M, MO, MSTR, NAP, O, PRE, SBT, SLEG, STA, TUR, U, UC, UCR, WA
<i>Macrozamia diplomera</i>	AMD, BR, CED, DAV, FTG, HNT, MO, PC, PRE, PRU, SLEG
<i>Macrozamia fawcettii</i>	CED, DAV, FTG, HNT, HONBG, SLEG, UC
<i>Macrozamia heteromera</i>	C, CBG, CED, DAV, FTG, HNT, K, KPBG, PRU, SLEG
<i>Macrozamia lucida</i>	CBG, CED, CHRC, FTG♀, KPBG, PRU, SLEG
<i>Macrozamia macdonnellii</i>	FTG, HONBG, K, LE, SLEG
<i>Macrozamia miquelii</i>	AMD, BO, BO(C), C, CBG, CED, DBN, FTG, HNT, HONBG, K, KPBG, LE, PC, PRU, SLEG
<i>Macrozamia moorei</i>	BR, C, CBG, CED, DAV, E♀, FTG♀, HNT, HONBG, KPBG, LE, MO, SLEG, UC, UCR
<i>Macrozamia pauli-guilielmi</i>	DAV, E, KPBG, MO, PRU, SLEG
subsp. <i>pauli-guilielmi</i>	CBG, CED, FTG, HONBG
subsp. <i>flexuosa</i>	CBG, CED, CGG, FTG, HNT, HONBG, PRE, SLEG
subsp. <i>plurinervia</i>	FTG, HNT, HONBG
<i>Macrozamia platyrachis</i>	CBG, HONBG
<i>Macrozamia riedlei</i>	CBG, CED, E, FTG, HNT, HONBG, K, KPBG♂, M, MJG, NY, SLEG, SRGH, STA, TUR, UC, UCR
<i>Macrozamia secunda</i>	BR, CED, DAV, FTG, HNT, HONBG, KPBG, MO, SLEG
<i>Macrozamia spiralis</i>	AMD♂, BR, CBG, CED, DAV, E♀, FTG, HNT, HONBG, LY, M, NAP, PC, PRE, SBT, SLEG
<i>Macrozamia stenomera</i>	CBG, CED, FTG, HNT, MO, SLEG
<i>Microcycas calocoma</i>	AMD, FTG♂, HONBG, LE, SLEG

<i>Zamia angustifolia</i>	C, CED, E, FTG♂♂, HNT, HONBG, MICH, SING, SLEG
<i>Zamia boliviana</i>	M
<i>Zamia chigua</i>	FTG♂, HONBG
<i>Zamia debilis</i>	DAV♀, FTG♀♂, PC, SRGH, U, UC, WU
<i>Zamia fischeri</i>	CED, DAV, FTG♀, HNT, HONBG, K♀, PRE, SLEG
<i>Zamia floridana</i>	AMD♀, B, BR, C, CAL, CED, CGG, DAV♀♂, FTG♀♂, HNT, HONBG, K, M, MICH, MJG, MO, NY, PC, PRU, SING, SLEG, STA, U, UC, UCR♀♂, Z
<i>Zamia kickxii</i>	CED, FTG, SBT♀
<i>Zamia latifolia</i>	CED, DBN, HONBG, LE, MJG, SLEG
<i>Zamia leiboldii</i>	C
<i>Zamia lindenii</i>	C, E♀, FTG, K, M
<i>Zamia loddigesii</i>	BO, BO(C), CED, FTG, HNT, HONBG, K♀♂, M, MO, MSTR, SLEG, UCR♂
<i>Zamia lucayana</i>	FTG
<i>Zamia madida</i>	FTG
<i>Zamia multifoliolata</i>	CED
<i>Zamia muricata</i>	BO, BO(C), C, CED, FTG, K, M
<i>Zamia ottonis</i>	BR, HBG, Z♂
<i>Zamia portoricensis</i>	E, FTG, K, SLEG
<i>Zamia pseudoparasitica</i>	CED, FTG, G, HONBG, K, SLEG, U, UC
<i>Zamia pumila</i>	B, BO, BO(P), C, CED, DAY, FTG, HNT, HONBG, K, MEXU, MO, NAP, O♀, SBT, SLEG♀, SRGH, UCR
<i>Zamia pygmaea</i>	FTG
<i>Zamia skinneri</i>	B, BO, FTG, HONBG, K, M, MO, SLEG, UCR♀♂
<i>Zamia tuerckheimii</i>	BO
<i>Zamia ulei</i>	M
<i>Zamia verschaffeltii</i>	Z

Commission du service de sauvegarde — Survival Service Commission

Comité des plantes menacées — Threatened Plants Committee

c/o Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 4.

THE BOTANIC GARDENS LIST OF MACARONESIAN THREATENED SPECIES

1981

FIRST DRAFT

COMPILED BY THE IUCN THREATENED PLANTS COMMITTEE SECRETARIAT
AT THE ROYAL BOTANIC GARDENS, KEW
FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

The TPC would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, July 1981

INTRODUCTION

Since October 1980 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of Macaronesian threatened plants for their annotations. The list covers species from the Azores, the Canary Islands and Madeira, but excludes the Cape Verde Islands, for which data are not available. So far we have received replies from 44 gardens, all but two of which hold some species. Of the 473 taxa on the list, 394 are being cultivated in one or more of these gardens. This is an impressive total - 83 per cent - but we hope that those members who have not yet responded will find time to reply so that we will have as complete a record as possible for inclusion in the proposed Botanic Gardens Green Book.

This report gives the information we have to date. It is in two sections.

First is a list of the botanic gardens which hold material of the listed species, with their codes.

The second part is the list itself, giving the names of Macaronesian threatened plants so far identified as in botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

The Royal Botanic Gardens, Kew, will be pleased to propagate and distribute to other members on request any of the species on the list held at Kew (identified by the symbol K).

Gren Lucas
Secretary

Key

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case (e.g. ABCD) indicates plants from a known cultivated source.

Lower case alone (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

INDEX OF CODES

CODE

INSTITUTION

AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
AMD	Hortus Botanicus, University of Amsterdam, Plantage Middenlaan 2, 1018DD, AMSTERDAM, The Netherlands.
B	Botanischer Garten and Botanisches Museum, Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BG	Botanisk Hage, P.O. Box 12, N-5014 BERGEN, Norway.
BLAN	Jardin Botanico Marimurtra, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BRES	Conservatoire Botanique du Stangelarc'h, 29200 BREST, France.
CGG	University of Cambridge Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, England.
DUSS	Botanischer Garten der Universität Düsseldorf, Universitätstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
GB	Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GOTEBORG, Sweden.
GBG	Botanic Gardens, Glasgow G12 OUE, Scotland.
HLU	University of Hull Botanic & Experimental Garden, Thwaite Street, COTTINGHAM, Yorkshire, England.
HNT	Huntingdon Botanical Gardens, 1151 Oxford Road, SAN MARINO, California 91108, U.S.A.
K	Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England. (Including Wakehurst Place).
KIEL	Botanischer Garten der Universität, Olshausenstrasse 40-60, Biologiezentrum, D-2300 KIEL, Federal Republic of Germany.
L	University Botanic Garden, Nonnensteeg 3, 2311 VJ LEIDEN, The Netherlands.
LAU	Jardin Botanique de l'Université et de la Ville de Lausanne, 14bis Avenue de Cour, CH-1007 LAUSANNE, Switzerland.

LISJC	Jardim e Museu Agricola do Ultramar, BELEM LISBOA 1400, Portugal.
LPA	Jardin Botanico "Viera y Clavijo", Tafira Alta, LAS PALMAS, Gran Canaria, Islas Canarias, Spain.
MADJ	Jardim Botanico do Madeira, FUNCHAL, Madeira, Portugal
MO	Missouri Botanical Garden, P.O. Box 299, ST LOUIS, Missouri 63166, U.S.A.
MTJB	Jardin Botanique de la Ville de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
NCY	Jardins Botaniques de la Ville et de l'Université de Nancy, 100 Rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NEU	Jardin Botanique, 11 Rue Emile-Argand, CH-2000, NEUCHATEL 7, Switzerland.
NGOET	Neuer Botanischer Garten der Universität, Grisebachstrasse 1a, 3400 GOTTINGEN, Federal Republic of Germany.
NICG	Jardin Botanique de Nice, Traverse de Arboras, 06200 NICE, France.
NPNZ	Parks and Recreation Department, Private Bag, New Plymouth, New Zealand.
NY	The New York Botanical Garden, BRONX, New York, 10458, U.S.A.
ORT	Jardin de Aclimatacion de la Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
OULU	Botanical Garden, University of Oulu, Box 191, SF 90100 OULU 10, Finland.
RNG	Botanic Garden, University of Reading, Whiteknights, READING RG6 2AS, England.
ROT	Arboretum Trompenburg, Groene Wetering 46, 3002 PC ROTTERDAM, The Netherlands.
SDAP	San Diego Wild Animal Park, Route 1, Box 725-E, ESCONDIDO, California 92025, U.S.A.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
TEG	Botanical Garden "Jochum-Hof", Maashoek 2b, STEYL, Gem. Tegelen, The Netherlands.

TRES	Tresco Abbey Gardens, TRESCO, Isles of Scilly, Cornwall, England.
U	University Botanical Garden, Transitorium 2, Heidelberglaan 2, 3508-TC UTRECHT, The Netherlands.
UBC	Botanical Garden, University of British Columbia, 6501 Northwest Marine Drive, VANCOUVER B.C., Canada V6T 1W5.
UPS	Botanical Garden of Uppsala, Villavagen 8, S-75236 UPPSALA, Sweden.
WAG	Belmonte Arboretum and Botanical Gardens, Generaal Foulkesweg 37, WAGENINGEN, The Netherlands.
WAI	Waimea Arboretum and Botanical Garden, Waimea Falls Park, Park Office, 59-864 Kamehameha Highway, HALEIWA 96712 Hawaii, U.S.A.
WTU	University of Washington Arboretum, SEATTLE, Washington 98195, U.S.A.
ZSS	Stadtische Sukkulentsammlung, Mythenquai 88, CH-8002, ZURICH, Switzerland.

LIST OF RARE AND THREATENED PLANTS OF MACARONESIA

(Excluding the Cape Verde Islands)

GYMNOSPERMAE

CUPRESSACEAE

Juniperus cedrus

AD, amd, b, BOCH+, BRES, DUSS, LPA+,
MADJ, NGOET, ort+

ANGIOSPERMAE

ACANTHACEAE

Justicia hyssopifolia

ad, BOCH+, K, LPA+, NGOET

AGAVACEAE

Dracaena draco

amd, b, bg, BLAN, BOCH+, bres, CGG,
DUSS, GB, GBG, hlu, HNT+, K, KIEL, L,
LAU, lisjc+, LPA, MADJ, MO, NCY,
NEU, ny, ORT+, OULU, rng, sdap+, sdzo,
tres, u, ups, WAG, WAI, ZSS

AMARYLLIDACEAE

Pancratium canariense

AD, BOCH, K, LPA+, MO, ORT+, UPS

AQUIFOLIACEAE

Ilex perado subsp. perado

AD, b, BOCH, KIEL, LPA, MADJ, UBC+

Ilex platyphylla

K, LPA, NPNZ+

ARACEAE

Dracunculus canariensis

AD, DUSS, KIEL, L, LPA+, MO, RNG

ASCLEPIADACEAE

Caralluma burchardii

AMD, B, BOCH, DUSS, K, KIEL, LPA+,
mo, NCY, ORT+, RNG+, ZSS

Ceropegia ceratophora

KIEL, LPA+, ZSS

Ceropegia chrysantha

KIEL

Ceropegia dichotoma

AMD, B, boch, CGG, DUSS, GB, HNT+,
K, KIEL, L, LPA+, mo, MTJB, NCY,
NICG, NY, ORT+, RNG+, u, UPS, ZSS

Ceropegia fusca AD, B, boch, CGG+, GB, GBG, HNT, K, KIEL, L, LAU, LPA+, NICG, ORT+, RNG+, ROT+, SDZO, u, UPS, WAG, ZSS

Ceropegia hians DUSS, GB, KIEL, LPA+, ORT, ROT, ZSS

Ceropegia krainzii boch, BRES, GB, KIEL, L, LPA+, ZSS

BERBERIDACEAE

Berberis maderensis MADJ

BORAGINACEAE

Echium auberianum b, BOCH+, BRES, ORT+

Echium bonnetii WAG

Echium callithyrsum LPA+, MO, tres+

Echium giganteum BRES, CGG, DUSS, HNT+, LPA, NICG, ORT+

Echium handiense LPA+, ORT+

Echium hierrense B, BOCH, K, LPA+

Echium leucophaeum B, blan, K, LPA+, MO

Echium pininana amd, b, BOCH+, bres, CGG, DUSS, HNT+, K, KIEL, LPA, ORT, tres+

Echium simplex b, BLAN, BRES, K, KIEL, LPA+, NICG, ort

Echium sventenii LPA, RNG+

Echium virescens B, boch, K, LPA+, MO, ORT+, tres+, UPS

Echium webbii amd, b, BRES, CGG, DUSS, K, LPA+, ORT+, tres+

Echium wildpretii AD, amd, bg, blan, BOCH+, CGG, DUSS, GB, GBG, hnt+, K, KIEL, lau, LPA, NCY, NICG, ORT+, U, UPS

Myosotis azorica K

CAMPANULACEAE

Azorina vidalii b, BOCH, BRES, duss, KIEL, lau, LPA+, OULU, tres+

Canarina canariensis AD, b, blan, BOCH, CGG+, DUSS, HNT, K, KIEL, LAU, LPA+, MO, ORT+, tres, U, UPS, WAI

Musschia aurea AD, amd, b, BOCH, BRES, K, LPA, MADJ, tres+, u, UPS

Musschia wollastonii AD, b, BOCH, BRES, CGG, DUSS, K, LPA, MADJ, tres+

CAPRIFOLIACEAE

Sambucus lanceolata MADJ, NCY

Sambucus palmensis LPA, ort

Viburnum tinus subsp. rigidum amd, BOCH, KIEL, LPA+, MO, teg, WAI

CARYOPHYLLACEAE

Bufonia teneriffae BOCH+, LPA

Cerastium sventenii K, LPA

Dicheranthus plocamoides B, LPA+, ORT+

Minuartia platyphylla LPA

Paronychia gomerensis b, LPA

Polycarpaea carnosa LPA, ORT+

Polycarpaea smithii LPA

Polycarpaea tenuis DUSS

Silene bourgeau AD, K, LPA+, tres

Silene lagunensis BRES, LPA+, tres

Silene nocteolens BOCH+, LPA

Silene pogonocalyx LPA

Silene sabinosae LPA

Spergularia azorica BRES, UPS

CELASTRACEAE

Maytenus canariensis AD, K, KIEL, LPA+, NGOET, ort+, TRES+, WAI

Maytenus dryandri MADJ

CISTACEAE

<i>Cistus osbeckiifolius</i>	b, <u>BOCH+</u> , <u>HNT+</u> , <u>NICG</u> , <u>ORT</u>
<i>Helianthemum bystropogophyllum</i>	AD, <u>LPA+</u>
<i>Helianthemum teneriffae</i>	BOCH, <u>ORT+</u>
<i>Helianthemum tholiforme</i>	<u>LPA+</u>
<i>Helianthemum thymiphyllum</i>	<u>LPA</u>

CNEORACEAE

<i>Neochamaelea pulverulenta</i>	AD, boch, <u>KIEL</u> , <u>LPA+</u> , <u>NCY</u> , <u>ORT</u>
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COMPOSITAE

<i>Andryala crithmifolia</i>	<u>BRES</u>
<i>Argyranthemum broussonetii</i>	AD, boch, <u>LPA+</u> , <u>ORT+</u>
<i>Argyranthemum callichrysum</i>	AD, <u>BOCH+</u> , <u>DUSS</u> , <u>LPA</u>
<i>Argyranthemum coronopifolium</i>	<u>K</u> , <u>LPA+</u> , <u>ORT+</u> , <u>UPS</u>
<i>Argyranthemum dissectum</i>	<u>LPA+</u>
<i>Argyranthemum escarrei</i>	BOCH, <u>LPA</u>
<i>Argyranthemum foeniculaceum</i>	AD, boch, cgg, <u>LPA+</u> , <u>ORT+</u> , <u>TRES+</u>
<i>Argyranthemum haemotomma</i>	<u>MADJ</u>
<i>Argyranthemum hierrense</i>	<u>LPA</u> , <u>MO</u> , <u>ORT+</u>
<i>Argyranthemum lemsii</i>	<u>CGG</u> , <u>LPA</u>
<i>Argyranthemum lidii</i>	<u>LPA</u>
<i>Argyranthemum maderense</i>	<u>LPA+</u>
<i>Argyranthemum pinnatifidum</i> subsp. <i>succulentum</i>	<u>BRES+</u> , <u>LPA</u>
<i>Argyranthemum sventenii</i>	<u>LPA</u> , <u>ORT+</u>
<i>Argyranthemum thalassophilum</i>	<u>LPA</u>
<i>Argyranthemum winteri</i>	<u>LPA+</u> , <u>NICG</u> , <u>ORT+</u> , <u>UPS</u>
<i>Artemisia argentea</i>	AD, b, <u>BRES+</u> , <u>MADJ</u>

<i>Artemisia ramosa</i>	<u>LPA</u> +
<i>Atractylis arbuscula</i>	<u>LPA</u>
<i>Atractylis preauxiana</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Bellis azorica</i>	<u>BRES</u>
<i>Calendula maderensis</i>	<u>BRES</u> , <u>K</u> , <u>UBC</u> +
<i>Carduus baeocephalus</i>	<u>LPA</u>
<i>Carduus squarrosus</i>	<u>LPA</u> , <u>MADJ</u>
<i>Carlina xeranthemoides</i>	<u>LPA</u> , <u>ORT</u> +
<i>Cheirolophus arboreus</i>	<u>LPA</u>
<i>Cheirolophus arbutifolius</i>	<u>BRES</u> +, <u>LPA</u> +
<i>Cheirolophus argutus</i>	<u>BOCH</u> +, <u>NGOET</u> , <u>ORT</u> +
<i>Cheirolophus canariensis</i>	boch+, <u>LPA</u> +, <u>NICG</u> , <u>ORT</u> +
<i>Cheirolophus duranii</i>	<u>LPA</u> , <u>ORT</u> +
<i>Cheirolophus ghomerythus</i>	<u>LPA</u> , <u>ORT</u> +
<i>Cheirolophus junonianus</i>	boch+, <u>BRES</u> , <u>CGG</u> , <u>LPA</u> +
<i>Cheirolophus satarataënsis</i>	<u>LPA</u>
<i>Cheirolophus sventenii</i>	<u>LPA</u> +
<i>Cheirolophus tagananensis</i>	<u>LPA</u> , <u>RNG</u> +
<i>Cheirolophus webbianus</i>	<u>LPA</u> , <u>ORT</u> +
<i>Cirsium latifolium</i>	<u>LPA</u> , <u>MADJ</u>
<i>Crepis canariensis</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Crepis divaricata</i>	<u>BRES</u>
<i>Gonospermum elegans</i>	<u>BOCH</u> , <u>LPA</u>
<i>Gonospermum gomerae</i>	<u>LPA</u> +
<i>Helichrysum gossypinum</i>	<u>K</u> , <u>LPA</u>
<i>Helichrysum monizii</i>	<u>BRES</u>
<i>Hypochoeris oligocephala</i>	<u>B</u> , <u>BOCH</u> +, <u>BRES</u> , <u>LPA</u> +, <u>ORT</u> +

<i>Lactucosonchus webbii</i>	<u>CGG</u>
<i>Lugoa revoluta</i>	<u>K</u> , <u>LPA</u> , <u>ORT</u> +
<i>Microderis filii</i>	<u>BRES</u>
<i>Microderis rigens</i>	b, <u>BRES</u>
<i>Phagnalon umbelliforme</i>	<u>LPA</u> +
<i>Pulicaria canariensis</i>	<u>K</u> , <u>LPA</u> , <u>ORT</u> +
<i>Reichardia crystallina</i>	<u>LPA</u> , <u>ORT</u> +
<i>Reichardia famarae</i>	AD, <u>LPA</u>
<i>Senecio appendiculatus</i>	amd, b, <u>BOCH</u> +, <u>K</u> , kiel, <u>LPA</u> +
<i>Senecio bollei</i>	<u>LPA</u> +
<i>Senecio hadrosomus</i>	<u>LPA</u>
<i>Senecio malvifolius</i>	<u>BRES</u>
<i>Senecio multiflorus</i>	<u>LPA</u>
<i>Senecio murrayi</i>	<u>LPA</u>
<i>Senecio palmensis</i>	<u>BOCH</u> , <u>LPA</u> , <u>ORT</u> +
<i>Senecio steetzii</i>	kiel
<i>Sonchus acaulis</i>	AD, b, <u>BOCH</u> +, <u>K</u> , <u>LPA</u> , <u>ORT</u> +
<i>Sonchus bornmuelleri</i>	<u>LPA</u> +, WAI
<i>Sonchus brachylobus</i>	AD, b, <u>BOCH</u> , <u>LPA</u> +
<i>Sonchus canariensis</i>	<u>BOCH</u> +, <u>LPA</u> +
<i>Sonchus fauces-orci</i>	<u>BOCH</u> +, <u>LPA</u>
<i>Sonchus gandogeri</i>	<u>LPA</u>
<i>Sonchus gonzalezpadronii</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Sonchus gummiifer</i>	b, <u>CGG</u> , <u>K</u> , <u>LPA</u>
<i>Sonchus ortunoi</i>	AD, <u>LPA</u>
<i>Sonchus pinnatus</i>	<u>LPA</u> , <u>MADJ</u> , tres+
<i>Sonchus tectifolius</i>	b, <u>LPA</u> +

<i>Sonchus ustulatus</i> subsp. <i>ustulatus</i>	<u>LPA</u> , <u>MADJ</u> , <u>UPS</u>
<i>Sonchus ustulatus</i> subsp. <i>maderensis</i>	<u>LPA</u>
<i>Sventenia bupleuroides</i>	<u>K</u> , <u>LPA</u> +
<i>Taeckholmia arborea</i>	<u>BOCH</u> , <u>LPA</u> , <u>UPS</u>
<i>Taeckholmia canariensis</i>	<u>LPA</u> , <u>UPS</u>
<i>Taeckholmia capillaris</i>	<u>LPA</u> +
<i>Taeckholmia microcarpa</i>	<u>LPA</u>
<i>Tanacetum ferulaceum</i>	<u>LPA</u> +, <u>MO</u>
<i>Tanacetum ptarmiciflorum</i>	<u>AD</u> , <u>K</u> , <u>LPA</u> +
<i>Tolpis azorica</i>	<u>b</u> , <u>BRES</u> , <u>ORT</u> +
<i>Tolpis crassiuscula</i>	<u>K</u> , <u>LPA</u> , <u>ORT</u> +
<i>Tolpis glabrescens</i>	<u>LPA</u>
<i>Tolpis macrorhiza</i>	<u>BOCH</u> , <u>LPA</u> , <u>UPS</u>
<i>Vieraea laevigata</i>	<u>b</u> , <u>BOCH</u> +, <u>K</u> , <u>LPA</u> +, <u>MO</u> , <u>ORT</u> , <u>rng</u>

CONVOLVULACEAE

<i>Convolvulus canariensis</i>	<u>AD</u> , <u>BLAN</u> , <u>LPA</u> +, <u>ORT</u> , <u>WAI</u>
<i>Convolvulus fruticosus</i>	<u>LPA</u> +
<i>Convolvulus lopez-socasi</i>	<u>LPA</u> +, <u>RNG</u> +
<i>Convolvulus massonii</i>	<u>BRES</u> , <u>LPA</u> , <u>MADJ</u>
<i>Convolvulus perraudieri</i>	<u>LPA</u>
<i>Convolvulus subauriculatus</i>	<u>LPA</u>

CRASSULACEAE

<i>Aeonium balsamiferum</i>	<u>blan</u> , <u>BOCH</u> , <u>CGG</u> +, <u>GB</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>NEU</u> , <u>ORT</u> +, <u>tres</u> +, <u>U</u> , <u>ZSS</u>
<i>Aeonium cuneatum</i>	<u>B</u> , <u>BOCH</u> , <u>DUSS</u> , <u>HNT</u> ; <u>K</u> , <u>KIEL</u> , <u>L</u> , <u>LPA</u> , <u>MTJB</u> , <u>ORT</u> , <u>tres</u> +, <u>ZSS</u>
<i>Aeonium gomeraense</i>	<u>AD</u> , <u>B</u> , <u>blan</u> , <u>boch</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>L</u> , <u>LPA</u> , <u>MTJB</u> , <u>NCY</u> , <u>NEU</u> , <u>NICG</u> , <u>NY</u> , <u>ORT</u> , <u>tres</u> +, <u>u</u> , <u>ZSS</u>

Aeonium haworthii	AD, <u>B</u> , bg, blan, <u>BOCH</u> , <u>DUSS</u> , GB, HNT, <u>K</u> , <u>KIEL</u> , L, <u>lisjc+</u> , <u>LPA+</u> , <u>MO</u> , MTJB, <u>NCY</u> , <u>NEU</u> , NY, <u>ORT+</u> , sdap, tres+, u, <u>UPS</u> , <u>ZSS</u>
Aeonium lancerottense	<u>B</u> , bg, <u>DUSS</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA+</u> , mtjb, <u>NEU</u> , <u>NICG</u> , <u>ORT</u> , tres+, <u>ZSS</u>
Aeonium nobile	AD, <u>B</u> , <u>BOCH</u> , <u>CGG</u> , <u>DUSS</u> , HNT+, <u>K</u> , <u>KIEL</u> , <u>LPA+</u> , <u>MO</u> , MTJB, <u>NCY</u> , <u>NEU</u> , <u>NICG</u> , <u>ORT+</u> , sdap, tres+, <u>UPS</u> , <u>ZSS</u>
Aeonium rubrolineatum	<u>GB</u> , HNT, <u>K</u> , <u>KIEL</u> , <u>LPA</u> , MTJB, <u>NCY</u> , <u>NEU</u> , teg, tres+, ups, <u>ZSS</u>
Aeonium saundersii	b, boch, <u>K</u> , <u>LPA+</u> , <u>NEU</u> , tres+, <u>ZSS</u>
Aeonium sedifolium	AD, amd, b, <u>BOCH</u> , GB, <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LAU</u> , <u>LPA+</u> , <u>MO</u> , MTJB, <u>NEU</u> , <u>ORT+</u> , OULU, sdap, tres+, <u>UPS</u> , <u>ZSS</u>
Aeonium smithii	<u>B</u> , <u>BOCH</u> , <u>DUSS</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>ORT+</u> , teg, tres+, <u>ZSS</u>
Aeonium tabuliforme	AD, amd, b, bg, blan, <u>BOCH</u> , bres, <u>DUSS</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA+</u> , <u>NEU</u> , NY, <u>ORT</u> , sdap, tres+, <u>WAI</u> , <u>ZSS</u>
Aeonium vestitum	<u>DUSS</u> , <u>K</u> , <u>LPA</u> , <u>NCY</u> , tres+
Aeonium virgineum	AD, boch, <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>MO</u> , <u>NEU</u> , tres+, <u>ZSS</u>
Aichryson bethencourtianum	boch+, <u>GBG</u> , HNT+, <u>K</u> , <u>KIEL</u> , <u>LPA</u> , tres+
Aichryson bollei	BRES, <u>CGG+</u> , <u>K</u> , <u>LPA</u> , <u>NCY</u> , tres+
Aichryson dumosum	tres+, UBC+
Aichryson pachycaulon	<u>K</u> , <u>LPA</u>
Aichryson palmense	<u>K</u> , <u>NCY</u> , tres+
Aichryson porphyrogenetos	<u>K</u> , <u>LPA</u>
Aichryson villosum	<u>BRES+</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , MTJB, tres+, <u>UPS</u>
Greenovia aizoon	<u>BOCH+</u> , duss, <u>KIEL</u> , <u>LPA</u> , <u>ORT+</u> , ROT, <u>TEG</u> , <u>ZSS</u>
Greenovia dodrentalis	<u>B</u> , <u>BOCH</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>MO</u> , MTJB, <u>NCY</u> , <u>ORT+</u> , OULU, rng+, tres+, <u>ZSS</u>

<i>Monanthes adenoscepes</i>	cgg+, <u>LPA</u> , <u>ORT</u> +
<i>Monanthes anagensis</i>	b, BOCH, <u>DUSS</u> , GB+, HNT+, <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>ORT</u> +, <u>UPS</u> , <u>ZSS</u>
<i>Monanthes lowei</i>	<u>KIEL</u> , <u>LPA</u>
<i>Monanthes muralis</i>	b, bg, BOCH+, GB, K, <u>KIEL</u> , <u>LPA</u> , NCY, tres+, u, ZSS
<i>Monanthes niphophila</i>	ZSS
<i>Monanthes pallens</i>	<u>K</u> , <u>LPA</u> +, <u>ORT</u> +, UPS
<i>Monanthes polyphylla</i>	ad, AMD, b, BOCH, CGG+, GB+, <u>HNT</u> +, K, <u>KIEL</u> , <u>LPA</u> , MTJB, <u>ORT</u> +, ZSS
<i>Monanthes silensis</i>	<u>ORT</u> +, <u>UPS</u>
<i>Sedum brissemoretii</i>	<u>K</u> , <u>LPA</u>
<i>Sedum farinosum</i>	b, <u>BRES</u> +, <u>K</u> , <u>LPA</u> , <u>UPS</u>

CRUCIFERAE

<i>Cakile edentula</i>	<u>BRES</u>
<i>Cardamine caldeirarum</i>	<u>BRES</u>
<i>Crambe arborea</i>	<u>LPA</u> , <u>ORT</u> +, <u>UPS</u>
<i>Crambe fruticosa</i>	<u>LPA</u> , <u>MADJ</u>
<i>Crambe gigantea</i>	<u>BRES</u> , <u>LPA</u>
<i>Crambe gomeraea</i>	<u>LPA</u>
<i>Crambe laevigata</i>	<u>LPA</u>
<i>Crambe pritzelii</i>	<u>LPA</u> +
<i>Crambe scaberrima</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Crambe scoparia</i>	<u>LPA</u> +
<i>Descurainia artemisioides</i>	amd, b, <u>LPA</u> , <u>UPS</u>
<i>Descurainia gilva</i>	<u>LPA</u>
<i>Descurainia gonzalezii</i>	<u>ORT</u> +
<i>Erysimum arbuscula</i>	BRES
<i>Parolinia intermedia</i>	<u>BRES</u> , <u>LPA</u> +

<i>Parolinia schizogynoides</i>	<u>LPA+</u> , <u>rng+</u>
<i>Sinapidendron angustifolium</i>	<u>BRES</u> , <u>LPA+</u>
<i>Sinapidendron frutescens</i>	<u>BRES</u> , <u>K</u> , <u>LPA</u> , <u>MADJ</u>
<i>Sinapidendron rupestre</i>	<u>BRES</u> , <u>CGG+</u> , <u>K</u> , <u>LPA</u> , <u>MADJ</u>
CYPERACEAE	
<i>Carex canariensis</i>	<u>BOCH</u> , <u>LPA</u>
<i>Carex malato-belizii</i>	<u>BRES</u>
<i>Carex perraudieriana</i>	<u>LPA</u>
DIPSACACEAE	
<i>Pterocephalus porphyranthus</i>	<u>BOCH</u> , <u>BRES</u>
<i>Pterocephalus virens</i>	<u>AD</u> , <u>K</u> , <u>LPA</u> , <u>ORT+</u>
ERICACEAE	
<i>Arbutus canariensis</i>	<u>BOCH+</u> , <u>CGG</u> , <u>K</u> , <u>kiel</u> , <u>LPA</u> , <u>NICG</u> , <u>ORT+</u> , <u>tres+</u>
<i>Daboecia azorica</i>	<u>BRES</u> , <u>CGG</u> , <u>ubc+</u>
<i>Erica maderensis</i>	<u>K</u>
<i>Erica scoparia</i> subsp. <i>azorica</i>	<u>BRES</u>
EUPHORBIACEAE	
<i>Euphorbia anachoreta</i>	<u>LPA</u>
<i>Euphorbia azorica</i>	<u>BRES</u> , <u>LPA</u>
<i>Euphorbia bourgeauana</i>	<u>K</u> , <u>LPA</u>
<i>Euphorbia bravoana</i>	<u>BLAN</u> , <u>GB</u> , <u>HNT</u> , <u>KIEL</u> , <u>LPA+</u> , <u>NICG</u> , <u>ZSS</u>
<i>Euphorbia handiensis</i>	<u>BOCH</u> , <u>BRES</u> , <u>DUSS</u> , <u>HNT</u> , <u>K</u> , <u>LPA</u> , <u>ORT+</u> , <u>ZSS</u>
<i>Euphorbia lambii</i>	<u>HNT+</u> , <u>KIEL</u> , <u>LPA+</u> , <u>NCY</u> , <u>ort+</u> , <u>SDZO</u>
<i>Euphorbia mellifera</i>	<u>AD</u> , <u>b</u> , <u>bres</u> , <u>LPA</u> , <u>MADJ</u> , <u>tres+</u>
<i>Euphorbia stygiana</i>	<u>BRES</u>
FRANKENIACEAE	
<i>Frankenia ericifolia</i>	<u>LPA</u> , <u>ORT+</u>

GENTIANACEAE

Ixanthus viscosus

BOCH, LPA, MO, ORT, tres+

GERANIACEAE

Geranium canariense

AD, amd, CGG, HNT+, K, L, LPA+,
NCY, NICG, ORT+, RNG+, tres+, UPS

Geranium maderense

AD, amd, BRES, CGG, GBG, HNT+, K, L,
LPA, MADJ, npnz+, tres+, U, UPS

Geranium rubescens

cgg, tres+

GRAMINEAE

Arrhenatherum calderae

BOCH+

Brachypodium arbuscula

LPA+, ORT

Dactylis smithii

K, LPA+, MADJ

Deschampsia argentea

BRES

Festuca agustini

LPA

Festuca albida

BRES, MADJ

Festuca donax

MADJ

Festuca jubata

BRES+

Melica teneriffae

BOCH, K, LPA

HYPERICACEAE

Hypericum glandulosum

BRES, LPA, MADJ, WAI

IRIDACEAE

Romulea columnae subsp. *hartungii*

CGG, NPNZ

JUNCACEAE

Luzula canariensis

BOCH, K, LPA, ORT, tres+

LABIATAE

Bystropogon canariensis

AD, BOCH, LPA+, ORT+, WAI

Bystropogon maderensis

K

Bystropogon origanifolius

AD, LPA

Bystropogon piperitus	<u>LPA</u>
Micromeria pineolens	<u>LPA+</u>
Micromeria rivas-martinezii	<u>LPA</u>
Nepeta teydea	AD, <u>BOCH+</u> , kiel, <u>LPA</u> , <u>ORT+</u> , <u>UPS</u>
Salvia broussonetii	AD, <u>CGG</u> , <u>HNT+</u> , <u>K</u> , <u>LPA+</u> , <u>ORT+</u> , WAI
Sideritis argosphacela	BOCH, <u>CGG</u> , <u>K</u> , <u>LPA+</u> , <u>ORT+</u> , <u>UPS</u>
Sideritis bolleana	<u>LPA</u> , <u>UPS</u>
Sideritis cabreræ	<u>HNT+</u> , <u>LPA</u>
Sideritis canariensis	gbg, <u>K</u> , <u>KIEL</u> , <u>LPA</u> , <u>ORT+</u> rng+
Sideritis candicans	<u>BOCH+</u> , <u>BRES</u> , <u>K</u> , <u>LPA</u> , <u>MADJ</u> , <u>NCY</u> , rng+, ups
Sideritis cystosiphon	<u>LPA</u>
Sideritis discolor	<u>LPA+</u> , <u>TRES+</u>
Sideritis gomeraea	AD, <u>HNT+</u> , <u>K</u> , <u>KIEL</u> , <u>LPA+</u> , <u>NCY</u> , rng+
Sideritis infernalis	<u>BOCH+</u> , <u>LPA</u> , <u>ORT+</u> , <u>RNG</u>
Sideritis macrostachya	AD, boch, <u>K</u> , <u>LPA</u> , <u>NCY</u> , rng+, <u>UPS</u> , WAI
Sideritis nervosa	<u>LPA</u>
Sideritis nutans	<u>LPA+</u> , <u>ORT+</u> , WAI
Sideritis pumila	<u>LPA</u> , <u>ORT+</u>
Sideritis sventenii	<u>LPA+</u>
Teucrium abutiloides	<u>K</u> , <u>MADJ</u>
Teucrium betonicum	AD, <u>LPA</u> , <u>UPS</u>
Teucrium heterophyllum	AD, b, <u>HNT+</u> , <u>LPA+</u> , MO, WAI
Thymus origanoides	<u>LPA+</u>

LAURACEAE

Apollonias ceballosi	<u>LPA+</u>
Ocotea foetens	amd, BLAN, boch, lisjc+, <u>LPA+</u> , <u>MADJ</u> , u

Persea indica

AD, b, blan, hnt+, KIEL, l, lisjc+, LPA+,
MADJ, NGOET, nicg+, sdzo

LEGUMINOSAE

Anagyris latifolia

LPA+, ORT

Anthyllis lemanniana

BRES, MADJ

Dorycnium broussonetii

K, LPA+, WAI

Dorycnium eriophthalmum

LPA+

Dorycnium spectabile

BOCH+, K, LPA, ORT+, tres+

Genista tenera

BRES, k, MADJ, WTU

Lotus berthelotii

AD, amd, b, BOCH+, bres, CGG, GB,
GBG, K, KIEL, l, lau, LPA+, MTJB, NCY,
NGOET, NPNZ+, ORT+, sdap+, teg,
tres+, u, UPS

Lotus callis-viridis

LPA

Lotus campylocladus

LPA, MO, ORT+

Lotus dumetorum

LPA

Lotus genistoides

LPA

Lotus holosericeus

LPA+

Lotus kunkelii

BRES, LPA+

Lotus leptophyllus

LPA+

Lotus macranthus

LPA, ort+

Lotus maculatus

BOCH+, LPA+, ort+

Lotus mascaensis

LPA

Ononis christii

LPA

Teline linifolia subsp. *gomeræ*

LPA

Teline linifolia subsp. *pallida*

LPA

Teline linifolia
subsp. *rosmarinifolia*

LPA+

Teline linifolia
subsp. *teneriffæ*

BOCH, LPA, ort+

<i>Teline paivae</i>	<u>BRES</u>
<i>Vicia aphylla</i>	<u>LPA</u>
<i>Vicia filicaulis</i>	<u>LPA</u>
<i>Vicia portosanctana</i>	<u>BRES</u>
<i>Vicia scandens</i>	<u>LPA</u>

LILIACEAE

<i>Androcymbium psammophilum</i>	boch
<i>Asparagus arborescens</i>	BOCH, hlu, K, <u>LPA+</u> , <u>ORT</u>
<i>Asparagus fallax</i>	<u>LPA</u> , <u>ORT+</u>
<i>Asparagus nesiotes</i>	<u>LPA+</u>
<i>Asparagus plocamoides</i>	<u>HNT+</u> , <u>LPA</u> , <u>ORT</u>
<i>Asparagus scoparius</i>	<u>LPA</u> , <u>MADJ</u> , <u>ORT+</u>
<i>Asparagus umbellatus</i> subsp. <i>lowei</i>	b, <u>MADJ</u>
<i>Ruscus streptophyllus</i>	<u>BRES</u> , CGG, <u>K</u> , <u>LPA</u> , <u>MADJ</u>
<i>Scilla haemorrhoidalis</i>	AD, DUSS, <u>K</u> , <u>LPA</u> , <u>ORT+</u> , UPS
<i>Scilla latifolia</i>	<u>K</u> , <u>LPA</u> +, ort+
<i>Scilla maderensis</i>	<u>LPA</u> , <u>MADJ</u>
<i>Semele androgyna</i>	blan, <u>BOCH+</u> , cgg+, DUSS, hlu, hnt+, <u>K</u> , <u>LPA+</u> , <u>MADJ</u> , ny, <u>ORT+</u> , tres+
<i>Semele gayae</i>	<u>LPA+</u> , <u>WAI</u>
<i>Smilax canariensis</i>	<u>BRES</u> , <u>LPA</u> , <u>MADJ</u>
<i>Smilax divaricata</i>	<u>BRES</u>

MALVACEAE

<i>Lavatera acerifolia</i>	b, <u>K</u> , <u>LPA+</u> , <u>ORT+</u>
<i>Lavatera phoenicea</i>	<u>LPA</u>

MYRSINACEAE

<i>Heberdenia excelsa</i>	<u>BOCH</u> , <u>LPA+</u>
<i>Pleiomeris canariensis</i>	<u>LPA</u>

OLEACEAE

<i>Jasminum azoricum</i>	AD, bres, cgg+, k, kiel, npnz+, ort, tres+
<i>Jasminum barrelierii</i>	boch, <u>LPA+</u> , <u>ORT+</u>
<i>Olea europaea</i> subsp. <i>maderensis</i>	<u>MADJ</u>
<i>Picconia azorica</i>	<u>BRES</u>
<i>Picconia excelsa</i>	blan, <u>BOCH</u> , K, <u>LPA+</u> , <u>MADJ</u> , <u>ORT</u>

ORCHIDACEAE

<i>Goodyera macrophylla</i>	<u>MADJ</u>
<i>Orchis scopulorum</i>	<u>K</u>
<i>Platanthera micrantha</i>	<u>BRES+</u>

PITTOSPORACEAE

<i>Pittosporum coriaceum</i>	blan, bres, <u>MADJ</u>
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PLANTAGINACEAE

<i>Plantago asphodeloides</i>	<u>LPA</u>
<i>Plantago famarae</i>	<u>LPA</u> , <u>ORT+</u>
<i>Plantago leiopetala</i>	<u>LPA+</u> , <u>MADJ</u>
<i>Plantago maderensis</i>	b, <u>BRES</u> , <u>LPA+</u> , <u>MADJ</u> , rng+, UPS
<i>Plantago malato-belizii</i>	<u>LPA</u>
<i>Plantago subspathulata</i>	AD, <u>LPA+</u>

PLUMBAGINACEAE

<i>Armeria maderensis</i>	<u>BRES</u>
<i>Limonium arborescens</i>	AD, amd, b, BLAN, <u>BOCH+</u> , bres, <u>K</u> , <u>LPA+</u> , MO, <u>ORT+</u> , tres+
<i>Limonium bourgeau</i>	<u>LPA</u> , <u>ORT+</u>
<i>Limonium brassicifolium</i>	<u>LPA</u>
<i>Limonium fruticans</i>	AD, boch, BRES, <u>K</u> , <u>LPA</u> , <u>ORT+</u> , <u>UPS</u>
<i>Limonium imbricatum</i>	<u>K</u> , <u>LPA</u> , <u>ORT+</u>

<i>Limonium macrophyllum</i>	<u>LPA</u> +
<i>Limonium macropterum</i>	<u>LPA</u>
<i>Limonium ovalifolium</i> subsp. <i>canariense</i>	<u>LPA</u>
<i>Limonium papillatum</i>	<u>LPA</u>
<i>Limonium perezii</i>	HNT+, <u>LPA</u> , <u>ORT</u> +
<i>Limonium preauxii</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Limonium puberulum</i>	BRES, <u>LPA</u> +, <u>ORT</u> +
<i>Limonium redivivum</i>	<u>LPA</u> +, <u>ORT</u> +
<i>Limonium rumicifolium</i>	<u>LPA</u> +
<i>Limonium spectabile</i>	BRES, <u>CGG</u> , <u>K</u> , <u>LPA</u>

RESEDACEAE

<i>Reseda scoparia</i>	<u>LPA</u> , <u>ORT</u> +
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RHAMNACEAE

<i>Rhamnus crenulata</i>	<u>K</u> , <u>LPA</u> +, <u>NGOET</u>
<i>Rhamnus glandulosa</i>	<u>CGG</u> , <u>LPA</u> +

ROSACEAE

<i>Bencomia brachystachya</i>	<u>LPA</u> +
<i>Bencomia caudata</i>	b, <u>BOCH</u> +, <u>K</u> , <u>LPA</u> +, MO
<i>Bencomia exstipulata</i>	<u>LPA</u> , <u>ORT</u> +
<i>Bencomia sphaerocarpa</i>	AD, BRES, <u>CGG</u> , <u>K</u> , <u>LPA</u> , WAI
<i>Chamaemeles coriacea</i>	<u>MADJ</u>
<i>Marcetella maderensis</i>	<u>BRES</u> , <u>LPA</u> +, <u>MADJ</u> , MO
<i>Marcetella moquiniana</i>	<u>BOCH</u> +, HNT+, <u>LPA</u> +, <u>ORT</u> +, rng+
<i>Prunus lusitanica</i> subsp. <i>azorica</i>	<u>BRES</u> , <u>CGG</u> , <u>KIEL</u>
<i>Rosa mandonii</i>	<u>LPA</u>
<i>Rubus hochstetterorum</i>	<u>BRES</u>
<i>Sorbus maderensis</i>	BRES, <u>K</u>

RUTACEAE

<i>Ruta microcarpa</i>	<u>LPA</u> +
<i>Ruta oreojasme</i>	<u>LPA</u> +, rng
<i>Ruta pinnata</i>	AD, <u>LPA</u> +

SAXIFRAGACEAE

<i>Saxifraga pickeringii</i>	BRES, <u>CGG</u> , <u>K</u> , <u>LPA</u>
<i>Saxifraga portosantana</i>	BRES, <u>CGG</u> , <u>K</u>

SCROPHULARIACEAE

<i>Euphrasia azorica</i>	<u>BRES</u>
<i>Isoplexis canariensis</i>	AD, AMD, B, BLAN, BOCH, CGG+, <u>DUSS</u> , <u>HNT</u> , <u>K</u> , <u>KIEL</u> , <u>LPA</u> , MTJB, NGOET, <u>NPNZ</u> , tres+, <u>UPS</u> , <u>WAI</u>
<i>Isoplexis chalcantha</i>	AD, <u>LPA</u> +, RNG
<i>Isoplexis isabelliana</i>	AD, b, BOCH+, <u>HNT</u> , <u>LPA</u> +, <u>WAI</u>
<i>Isoplexis sceptrum</i>	<u>BRES</u> , <u>LPA</u> , <u>MADJ</u> , tres+, UBC+, <u>UPS</u>
<i>Kickxia pendula</i>	<u>BRES</u> , <u>LPA</u>
<i>Kickxia urbanii</i>	<u>LPA</u> +
<i>Scrophularia anagae</i>	<u>LPA</u>
<i>Scrophularia calliantha</i>	<u>LPA</u> , <u>WAI</u>
<i>Scrophularia langeana</i>	ad, <u>LPA</u>
<i>Scrophularia smithii</i>	<u>K</u> , <u>LPA</u> +
<i>Sibthorpia peregrina</i>	<u>BRES</u> , <u>CGG</u> , gbg, <u>MADJ</u> , <u>UPS</u>
<i>Sutera canariensis</i>	<u>LPA</u> , <u>ORT</u> +
<i>Veronica dabneyi</i>	<u>BRES</u>

SELAGINACEAE

<i>Globularia ascanii</i>	<u>LPA</u>
<i>Globularia sarcophylla</i>	ad, <u>LPA</u> +

SOLANACEAE

Solanum lidii AD, BRES, LPA+

Solanum vespertilio BRES, K, LPA+

THEACEAE

Visnea mocanera AD, amd, BOCH+, HNT, K, KIEL, LPA,
MADJ, nicg, ORT+

UMBELLIFERAE

Bunium brevifolium K

Bupleurum handiense boch, LPA, NEU

Chaerophyllum azoricum BRES

Imperatoria lowei MADJ

Melanoselinum decipiens BRES, LPA, MADJ

Monizia edulis MADJ

Oenanthe pteridifolia BRES

Pimpinella anagodendron boch, bres+, CGG, K, LPA+

Rutheopsis herbanica ORT+

Sanicula azorica BRES

Seseli webbii LPA+, ORT+

Tinguarra cervariaefolia LPA+

URTICACEAE

Gesnouiinia arborea LPA, NGOET, ORT+, u

Parietaria filamentosa LPA

VIOLACEAE

Viola cheiranthifolia BOCH

Viola palmensis LPA

UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES
INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

Commission du service de sauvegarde — Survival Service Commission

Comité des plantes menacées — Threatened Plants Committee

c/o Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 5.

THE BOTANIC GARDENS LIST OF THREATENED SPECIES FOR SOUTHERN AFRICA 1982

FIRST DRAFT

COMPILED BY THE IUCN THREATENED PLANTS COMMITTEE SECRETARIAT
AT THE ROYAL BOTANIC GARDENS, KEW
FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

The TPC would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, June 1982

INTRODUCTION

Since July 1980 we have sent to members of the Botanic Gardens Conservation Co-ordinating Body a list of Southern African threatened plants for their annotations. This list was based on a report* by Dr A.V. Hall and his colleagues in Cape Town who kindly allowed us to use this data. So far about 52 gardens have replied, most of whom have at least one or two species. As well as these gardens we have annotations from the six regional gardens under the control of the Botanic Garden at Kirstenbosch and, thanks to the considerable work of Dr E.E. Gogina of Moscow, from 116 gardens in the U.S.S.R.

Of the 1045 taxa on the list, only 411 are recorded as in cultivation; two of these, Encephalartos woodii and Caralluma arenicola, are considered extinct in the wild. We will be very pleased to hear from those members who have not yet responded as we constantly update our files, and hope to publish as complete a record as possible in the proposed Botanic Gardens Green Book.

The first part of this report shows which gardens hold material of the listed species, with their codes.

The second part is the list of those species so far identified as in botanic gardens. After each name is given the codes of those gardens which hold material of the species.

The aim is that those members who would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this will be helpful to managers and curators in planning and building their collections, and will help to remove pressure on wild stocks.

The Royal Botanic Gardens, Kew (code K) will be pleased to propagate and distribute to other members on request any species marked on the list as growing at Kew.

KEY

Upper case underlined (e.g. ABCD) indicates plants of known wild origin.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case alone (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material the wild source code is used as, clearly, the wild source material is the more valuable.

* Hall, A.V., de Winter, M., de Winter, B. and van Oosterhout, S.A.M. (1980). Threatened Plants of South Africa. South African National Scientific Programmes Report No. 45. Cooperative Sciences Programmes, Council for Scientific and Industrial Research, Pretoria. 244 pp.

INDEX OF CODES

CODE

INSTITUTION

AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
AMD	Hortus Botanicus, University of Amsterdam, Plantage Middenlaan 2, 1018DD, AMSTERDAM, The Netherlands.
ASH	Turkmen Botanical Garden of the Academy of Sciences, 744012 ASHKABAD, Timiryazev 17, U.S.S.R.
B	Botanischer Garten und Botanisches Museum, Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BAK	Botanical Garden of the Komarov Botanical Institute, Potamdarskoye Avenue 40, 3701 22 BAKU 73, U.S.S.R.
BATU	Batumi Botanical Garden of the Georgian Academy of Sciences, Post Office Machindzauri, 384533, BATUMI, U.S.S.R.
BERN	Botanischer Garten der Universität, Altenbergrain 21, CH-3031, BERNE, SWITZERLAND.
BGAAS	Botanical Garden of the Armenian Academy of Sciences, P.O. Avan. 375063, YEREVAN, U.S.S.R.
BLAN	Jardin Botanico Marimurtra, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, MEISE B-1860, Belgium.
BRES	Conservatoire Botanique du Stangelarc'h, 29200 BREST, France.
CGG	University of Cambridge Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, England.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Republic of Ireland.
DSU	Botanical Garden of the State University, Gagarin Street 72a, 320010 DNIETROPETROVSK 10, U.S.S.R.
DTSK	Donetsk Botanical Garden, Elevatornaya Street 19, 340079, DONETSK 3, U.S.S.R.

DUSS	Botanischer Garten der Universität Düsseldorf, Universitätstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.
GB	Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GÖTEBORG, Sweden.
GBG	Botanic Gardens, Glasgow G12 0UE, Scotland, U.K.
GOET	Alter Botanischer Garten der Universität, Unter Karspüle 1, D-3400 GÖTTINGEN, Federal Republic of Germany.
GORK	Botanical Garden of the State University, 603062 GORKY 62, U.S.S.R.
HK	Agriculture and Fisheries Department, 393 Canton Road, 12/F, KOWLOON, Hong Kong.
HLU	University of Hull Botanic and Experimental Garden, Thwaite Street, COTTINGHAM, Yorkshire, England.
K	Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England. (Including Wakehurst Place).
KALI	Botanical Garden of the State University, Belomorskaya Street 20, 236029, KALININGRAD, U.S.S.R.
KAUN	Botanical Garden of the Lithuanian Academy of Sciences, Botanikos Prospect 4, 233019 KAUNAS 19, U.S.S.R.
KAZZ	Zoobotanic Garden, Khadi Taktash Street, 112, KAZAN 41, Tatar, U.S.S.R.
KHAR	Botanical Garden of the State University of Klochkovskaya 52, 310022 KHARKOV, U.S.S.R.
KIEL	Botanischer Garten der Universität, Olshausenstrasse 40-60, Biologiezentrum, D-2300 KIEL, Federal Republic of Germany.
KPABG	Polar-Alpine Botanic Garden, 1854230 KIROVSK-2, Murmansk Region, U.S.S.R.
KYM	University Botanical Garden, Unioninkatu 44, 00170 HELSINKI 17, Finland.
L	University Botanic Garden, Nonnensteeg 3, 2311 VJ LEIDEN, The Netherlands.
LE	Botanical Garden of the Komarov Botanical Institute, Professor Popov Street 2, 197022, LENINGRAD 22, U.S.S.R.
LECB	Botanical Garden of the Leningrad State University, Universitetskay nab. 7-9, 199164 LENINGRAD V-164, U.S.S.R.

LEVAV	Vavilov All Union Research Inst. of Plant Industry, Herzen Street 44 190000, LENINGRAD, U.S.S.R.
LISJC	Jardim e Museu Agricola do Ultramar, BELEM LISBOA 1400, Portugal.
LIVC	City of Liverpool Botanic Garden, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
MHA	Main Botanical Garden, Botanicheskaya Street 4, 127276 MOSCOW, 276, U.S.S.R.
MIL	Mitchell Park Conservatory, 524 South Layton Boulevard, MILWAUKEE, Wisconsin 53215, U.S.A.
MO	Missouri Botanical Garden, P.O. Box 299, St Louis, Missouri 63166, U.S.A.
MSK	Central Botanical Garden of the Byelorussian Academy of Sciences, Academicheskaya Street 31, 220072 MINSK 72, Byelorussia, U.S.S.R.
MTJB	Jardin Botanique de la Ville de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
MW	Botanical Garden of the Moscow Lomonosov State University, Lenin Hills, MGU, 117234, MOSCOW B-234, U.S.S.R.
NBG	National Botanic Gardens of South Africa, Kirstenbosch, Private Bag X7, CLAREMONT 7735, South Africa.
NBGB	Orange Free State Botanic Garden, BLEOMFONTEIN, O.F.S., South Africa.
NBGD	Drakensberg Botanic Garden, HARRISMITH, O.F.S., South Africa.
NBGH	Harold Porter Botanic Garden, BETTY'S BAY, Cape Province, South Africa.
NBGK	Karoo Botanic Garden, WORCESTER, Cape Province, South Africa.
NBGL	Lowveld Botanic Garden, NELSPRUIT, South Africa.
NBGN	Natal Botanic Garden, PIETERMARITZBURG, Natal, South Africa.
NCY	Jardins Botaniques de District et Université Nancy, 100 Rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NIJ	University Botanic Garden, Toernooiveld, NIJMEGEN, The Netherlands.
NOVB	Central Siberian Garden, 101 Zolotodolinskaya Ul., 630090 NOVOSIBIRSK - 90, U.S.S.R.
NPNZ	Pukekura Park, Parks and Recreation Department, City Council, Private Bag, NEW PLYMOUTH, New Zealand.

NSM	Sun-Yat-Sen Memorial Botanical Garden, NANJING, Kiangsu Province, China.
NY	The New York Botanical Garden, BRONX, New York 10458, U.S.A.
ORT	Jardin de Aclimatacion de la Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
OULU	Botanical Garden, University of Oulu, Box 191, SF 90100 OULU 10, Finland.
PALZ	Ente Giardini Botanici Villa Taranto, I-28048 VERBANIA PALLANZA, Lago Maggiore, Italy.
PRE	Pretoria National Botanic Garden, Botanical Research Institute, Private Bag X101, PRETORIA, South Africa 001.
PRU	University Botanic Garden, PRETORIA 0002, South Africa.
RIG	Botanical Garden of the Latvian State University, L.Kandavas Street 2, 226007 RIGA 7, U.S.S.R.
RIGA	Botanical Garden of the Latvian Academy of Sciences, 229021 RIGA, P.O. Salaspils, U.S.S.R.
RNG	Botanic Garden, University of Reading, Whiteknights, READING RG6 2AS, U.K.
ROT	Arboretum Trompenburg, Groene Wetering 46, 3002 PC ROTTERDAM, The Netherlands.
RV	Botanical Garden of the Molotov State University, 344000 ROSTOVON DON, P.O. 2, U.S.S.R.
SASY	Botanical Garden of the Yakutsk Academy of Sciences Chuchur-Muran, 677010, YAKUTSK, U.S.S.R.
SBT	Bergianska Tradgarden (Hortus Bergianus), Postbox 50017, 1045 STOCKHOLM 50, Sweden.
SDAP	San Diego Wild Animal Park, Route 1, Box 725-E, ESCONDIDO, California 92025, U.S.A.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
SVER	Botanical Garden of the Institute of Ecology, 8 Marta Street 202, 620008, SVERDLOVSK 8, U.S.S.R.
TAD	Botanical Garden of the Botanical Institute, DUSHAMBE 17, U.S.S.R.

TALL	Botanical Garden of the Tallin Academy of Sciences, Kloostrimetsa Street 44, 200019 TALLIN, Estonia, U.S.S.R.
TASH	Botanical Garden of the Uzbek Academy of Sciences, Jakhan-Abidovoi Street 272, 700000 TASHKENT 53, U.S.S.R.
TBI	Tbilisi Central Botanical Garden, 380005, TBILISI P.O. 5, U.S.S.R.
TCD	Trinity College Botanic Garden, DUBLIN 2, Republic of Ireland.
TEG	Botanical Garden "Jochum-Hof", Maashoek 2b, STEYL, Gem. Tegelen, The Netherlands.
TK	Siberian Botanical Garden of Tomsk State University, V.V.Kuibsheva, Lenin Avenue 36, TOMSK, U.S.S.R.
TRES	Tresco Abbey Gardens, TRESCO, Isles of Scilly, Cornwall, U.K.
U	Rijksuniversiteit Utrecht Botanische Tuinen, Heidelberglaan 2, 3508-TC UTRECHT, The Netherlands.
UBC	Botanical Garden, University of British Columbia, 6501 Northwest Marine Drive, VANCOUVER B.C., Canada V6T 1W5.
VOR	Botanical Garden of the Voronezh State University, 394012 VORONEZH 12, U.S.S.R.
WAG	Belmonte Arboretum and Botanical Gardens, 37 Generaal Foulkesweg 37, WAGENINGEN, The Netherlands.
WAHO	Institute for Horticultural Plant Breeding, Mansholtlaan 15, WAGENINGEN, The Netherlands.
WAI	Waimea Arboretum and Botanical Garden, Waimea Falls Park, Park Office, 59-864 Kamehameha Highway, HALEIWA 96712 Hawaii, U.S.A.
WI	Botanical Garden of the Vilnius State University, Churlionio 110, VILNIUS, U.S.S.R.
YALT	State Nikita Botanical Garden, 334267 YALTA, Crimea, U.S.S.R.
ZSS	Städtische Sukkulentsammlung, Mythenquai 88, CH-8002, ZURICH, Switzerland.

LIST OF RARE AND THREATENED PLANTS OF SOUTHERN AFRICA

PTERIDOPHYTA

MARSILEACEAE

Marsilea schelpeana K, NBG

GYMNOSPERMAE

CUPRESSACEAE

Widdringtonia cedarbergensis b, br, DUSS, E, KIEL, NBG, PRE, SDAP,
TRES+, WAG

ZAMIACEAE

Encephalartos altensteinii AD, amd, b, br, CGG, DUSS, E, GBG, k,
l, LISJC, MHA, NBG, NPNZ, PRE+, pru,
sdzo, tcd, u, wag

Encephalartos arenarius AMD, MIL, NBG, NY, PRE, pru, SDZO

Encephalartos caffer AMD, b, br, dbn, lisjc, NBG, NBGK+,
PRE, pru

Encephalartos cupidus NBG, PRE, pru

Encephalartos cycadifolius br, K, NBG, PRE, pru

Encephalartos eugene-maraisii K, NBG, NBGL, PRE, pru

Encephalartos ferox AMD, B, br, E, GBG, hk, K, MHA, mil,
mo, NBG, NBGL, nbgn, NPNZ, PRE+,
pru, SDAP, sdzo, WAG, waho

Encephalartos friderici-guilielmi AMD, NBG, PRE

Encephalartos ghellinckii NBG, PRE, pru

Encephalartos heenanii NBG, PRE, pru, SDAP

Encephalartos horridus AMD, b, BERN, blan, br, k, kiel, l, lisjc,
MHA, mo, NBG, NY, PRE+, pru, SDZO,
u, wag

Encephalartos humilis NBG, NBGL, PRE, pru

Encephalartos inopinus NBGL, PRE, pru, SDZO

<i>Encephalartos laevifolius</i>	<u>NBG</u> , <u>NBGL</u> , <u>PRE</u> , pru
<i>Encephalartos lanatus</i>	AMD, <u>B</u> , NBG, <u>NBGL</u> , <u>PRE</u> +, pru, SDAP
<i>Encephalartos latifrons</i>	k, NBG, <u>PRE</u>
<i>Encephalartos lebomboensis</i>	AD, AMD, <u>E</u> , hk, K, lisjc, MTJB, <u>NBG</u> , <u>NBGL</u> , <u>PRE</u> +, pru, SDAP
<i>Encephalartos lehmannii</i>	AD, amd, b, br, CGG, DUSS, E, <u>K</u> , lisjc, mo, NBG, nbgk+, <u>NBGL</u> , NPNZ, <u>PRE</u> , pru, SDAP, u
<i>Encephalartos longifolius</i>	AMD, BR, DUSS, <u>K</u> , <u>MO</u> , NBG, nbgk, <u>PRE</u> , pru, SDAP, SDZO
<i>Encephalartos natalensis</i>	AMD, DUSS, E, hk, K, NBG, <u>NBGL</u> , nbgn, <u>PRE</u> , pru, SDAP
<i>Encephalartos ngoyanus</i>	<u>NBG</u> , <u>PRE</u> , pru
<i>Encephalartos paucidentatus</i>	MTJB, <u>NBG</u> , <u>NBGL</u> , <u>PRE</u> , pru
<i>Encephalartos princeps</i>	ad, AMD, DUSS, NBG, NBGK, <u>PRE</u> , pru, SDAP, SDZO
<i>Encephalartos transvenosus</i>	amd, B, BR, DUSS, E, hk, <u>K</u> , NBG, <u>NBGL</u> , <u>PRE</u> , pru, SDAP, SDZO
<i>Encephalartos trispinosus</i>	amd, br, k, NBG, NBGK, <u>PRE</u> , pru, SDZO
<i>Encephalartos villosus</i>	AD, AMD, b, br, dbn, DUSS, E, k, khar, l, lisjc, MHA, MTJB, NBG, NBGK, <u>NBGL</u> , nbgn, pre, pru, SDAP, sdzo, u
<i>Encephalartos woodii</i>	dbn, k, NBG, <u>PRE</u> , WAI

ANGIOSPERMAE

AIZOACEAE

<i>Berrisfordia khamiesbergensis</i>	<u>NBG</u> , nbgk+, <u>ZSS</u>
<i>Caryotophora skiatophytoides</i>	<u>KIEL</u>
<i>Didymaotus lapidiformis</i>	AD, BR, <u>E</u> , <u>K</u> , <u>MO</u> , <u>NBG</u> , NCY, <u>PRE</u> , <u>ZSS</u>
<i>Dinteranthus vanzylii</i>	br, kiel, MIL, <u>NBG</u> , <u>PRE</u> , <u>ZSS</u>
<i>Diplosma retroversum</i>	B, <u>NBGK</u> +

<i>Dorotheanthus bidouwensis</i>	MO, <u>NBG</u> +
<i>Dorotheanthus booyseii</i>	<u>NBG</u>
<i>Faucaria candida</i>	kiel, MIL, WAHO
<i>Frithia pulchra</i>	boch+, BR, GOET, kiel, <u>NBG</u> <u>NBGK</u> , <u>PRE</u> +, tcd, TEG, WAHO, <u>ZSS</u>
<i>Herreanthus meyeri</i>	br, CGG, K, kiel, MTJB, <u>NBG</u> +, <u>NBGK</u> +, <u>PRE</u> +, WAHO, ZSS
<i>Juttadinteria albata</i>	BOCH+, <u>DUSS</u> , kiel, <u>NBG</u>
<i>Juttadinteria tetrasepala</i>	kiel, <u>NBG</u> +
<i>Lithops comptonii</i>	<u>DUSS</u> , E, K, kiel, LE, MIL, MTJB, <u>NBG</u> , <u>NBGK</u> +, WAHO, ZSS
<i>Lithops divergens</i>	DBN, <u>DUSS</u> , GB, kiel, MIL, MO, MTJB, <u>NBG</u> , <u>NBGK</u> +, NY, RIG, RV, TEG, u, WAHO, ZSS
<i>Lithops salicola</i>	b, BERN, boch+, br, DBN+, <u>DUSS</u> , E, GB, K, KALI, kiel, L, LE, MIL, MO, MTJB, MW+, <u>NBG</u> , <u>NBGK</u> +, NY, ORT+, OULU, <u>PRE</u> +, pru, RIG, RV+, SASY+, tcd, TEG, u, WAHO, ZSS
<i>Maughaniella luckhoffii</i>	b, K
<i>Mossia intervallaris</i>	<u>NBG</u> , <u>PRE</u>
<i>Muiria hortenseae</i>	<u>BOCH</u> , BR, <u>DUSS</u> , goet, <u>KIEL</u> , <u>ZSS</u>
<i>Nelia pillansii</i>	<u>NBG</u>
<i>Neohenricia sibbettii</i>	BOCH+, br, BRES, GOET, K, kiel, MO, <u>NBG</u> , <u>NBGK</u> +, <u>PRE</u> , WAHO, ZSS
<i>Oophytum oviforme</i>	<u>DUSS</u> , <u>KIEL</u> , MIL, <u>NBG</u> , ZSS
<i>Ophthalmophyllum australe</i>	MTJB
<i>Ophthalmophyllum verrucosum</i>	<u>NBG</u> , WAHO
<i>Ophthalmophyllum villetii</i>	kiel, <u>PRE</u>
<i>Pherolobus maughani</i>	<u>NBGK</u> +
<i>Pleiospilos hilmarii</i>	b, E, GOET, K, <u>NBG</u> , <u>NBGK</u> +, NCY, <u>PRE</u> , TEG, WAHO, ZSS

<i>Pleiospilos leipoldtii</i>	/bgaas, DUSS, E, <u>NBG</u> , NCY, RV
<i>Pleiospilos prismaticus</i>	BERN, bgaas, BOCH, DUSS, <u>E</u> , kiel, <u>NBG</u> , <u>NBGK+</u> , RIGA, ZSS
<i>Rabiea jamesii</i>	<u>KIEL</u>
<i>Rhinephyllum inaequale</i>	<u>KIEL</u>
<i>Sceletium expansum</i>	<u>PRE</u>
<i>Schwantesia acutipetala</i>	b, E, <u>MO</u>
<i>Schwantesia pillansii</i>	CGG, <u>KIEL</u>
<i>Schwantesia triebneri</i>	br, k, MTJB, <u>NBG</u> , WAHO
<i>Trichodiadema densum</i>	b, bak, boch, br, DBN, E, <u>KIEL</u> , LE, lecb, MIL, MTJB, <u>NBG</u> , NY, <u>PRE</u> , RV, TEG, tres+, WAHO, wi
<i>Trichodiadema peersii</i>	br, E, <u>KIEL</u> , LECB, <u>PRE</u> , RV
<i>Trichodiadema pygmaeum</i>	L
<i>Trichodiadema rogersiae</i>	b, br, E, L, <u>NBG</u>

AMARYLLIDACEAE

<i>Brunsvigia litoralis</i>	<u>NBG+</u> , <u>PRE</u>
<i>Clivia caulescens</i>	<u>ASH</u> , B, <u>E</u> , <u>K</u> , <u>NBG</u> , <u>NBGL+</u>
<i>Clivia gardenii</i>	AD, br, e, <u>K</u> , KALI, <u>NBG</u> , RIG, SBT
<i>Clivia miniata</i>	AD, <u>ASH+</u> , B, batu, bgaas, BLAN+, br, CGG, dsu, duss, e, gbg, goet, hk+, hlu, k, KALI, kaun+, khar, kiel, kym, LE, lecb, lisjc, MHA, mil, mo, <u>NBG</u> , nbgl+, NBGN, ncy, npnz+, NY, ort+, oulu, <u>PRE</u> , pru, RIG, RIGA, rng, RV+, SASY+, sbt, SDAP, TAD+, tall, TASH+, tbi, TEG+, TK+, tres+, u, WAI, WI
<i>Clivia nobilis</i>	<u>ASH</u> , B, batu, blan+, e, hk+, <u>K</u> , KALI, kaun+, KAZZ, kiel, LE, <u>LECB</u> , mil, <u>NBG</u> , NBGN, ncy, NSM, OULU, <u>PRE</u> , rv+, SDZO+, SVER+, TALL, tbi, u+
<i>Crinum acaule</i>	<u>PRE</u>

<i>Crinum campanulatum</i>	<u>K</u> , <u>NBG</u>
<i>Crinum lineare</i>	<u>PRE</u> , SVER
<i>Crinum rautanenianum</i>	<u>K</u> , <u>PRE</u>
<i>Cyrtanthus clavatus</i>	<u>NBG+</u> , <u>PRE</u>
<i>Cyrtanthus eucallus</i>	<u>K</u> , <u>NBGL+</u> , PRE
<i>Cyrtanthus falcatus</i>	CGG, <u>E</u> , <u>K</u> , <u>NBG</u> , <u>PRE</u>
<i>Cyrtanthus guthrieae</i>	AD
<i>Cyrtanthus helictus</i>	AD
<i>Cyrtanthus herrei</i>	<u>E</u> , <u>NBG</u> , <u>PRE</u>
<i>Cyrtanthus huttonii</i>	<u>NBG</u> , <u>PRE</u>
<i>Cyrtanthus loddigesianus</i>	<u>PRE</u>
<i>Cyrtanthus smithii</i>	<u>NBG</u>
<i>Cyrtanthus spiralis</i>	<u>NBG+</u>
<i>Cyrtanthus staadensis</i>	<u>PRE</u>
<i>Cyrtanthus thorncroftii</i>	<u>PRE</u>
<i>Haemanthus amarylloides</i>	<u>K</u> , <u>NBG</u> , <u>PRE</u>
<i>Haemanthus canaliculatus</i>	<u>NBG</u>
<i>Hessea chaplinii</i>	<u>NBG+</u>
<i>Hessea karooica</i>	<u>NBG+</u>
<i>Nerine gibsonii</i>	<u>K</u> , <u>NBG</u>
<i>Nerine gracilis</i>	<u>PRE</u>
ANACARDIACEAE	
<i>Rhus rogersii</i>	<u>NBGL+</u> , <u>PRE</u>
APOCYNACEAE	
<i>Adenium oleifolium</i>	<u>PRE</u> , sdap, ZSS
<i>Adenium swazicum</i>	boch+, <u>NBGL+</u> , <u>PRE</u> , ZSS

Pachypodium namaquanum

BOCH, br, CGG, LE, NBG, PRE, ZSS

Pachypodium saundersii

AMD, BOCH, DUSS, GBG, goet, K, LE, NBG, NBGL+, NY, PRE, pru+, ROT, SDZO, WAHO, WAI, ZSS

Strophanthus luteolus

PRE

APONOGETONACEAE

Aponogeton ranunculiflorus

K, TRES

ARACEAE

Zantedeschia albomaculata
sp. valida

ASH, br, dtsk, K, kiel, MHA, NOVB, PRE, UBC

Zantedeschia pentlandii

NBG, PRE

ASCLEPIADACEAE

Caralluma acutiloba

K, KIEL, NBGK+, ZSS

Caralluma arenicola

NBGK

Caralluma bredae
var. bredae

KIEL, NBGK+

Caralluma cincta

kiel, NBGK

Caralluma linearis

NBGK+

Caralluma maughani

NBGK+, ZSS

Caralluma pillansii

AD, KIEL, NBGK+, PRE

Caralluma pruinosa

KIEL, NBGK+

Caralluma ubomboensis

KIEL, PRE+

Caralluma villetii

KIEL

Duvalia maculata

K, KIEL, NBGK+

Duvalia parviflora

KIEL, NBGK+

Echidnopsis columnaris

NBGK+, PRE+

Hoodia barklyi

DUSS, NBGK+

Hoodia dregei

duss, NBGK+, ZSS

<i>Hoodia pillansii</i>	e, goet, MTJB, NY
<i>Huernia distincta</i>	<u>KIEL</u> , MIL, MO, <u>NBGK</u> +
<i>Huernia humilis</i>	<u>NBGK</u> +
<i>Huernia insigniflora</i>	br, <u>KIEL</u> , <u>NBGK</u> , <u>PRE</u> +, ZSS
<i>Huernia kennedyana</i>	<u>KIEL</u> , MIL, <u>NBGK</u> +
<i>Huernia longii</i>	<u>KIEL</u> , <u>NBGK</u> +, ZSS
<i>Huernia pillansii</i>	E, goet, <u>KIEL</u> , MIL, <u>NBGK</u> +, NY, <u>PRE</u> , WAHO, zss
<i>Huernia praestans</i>	goet, <u>KIEL</u> , <u>NBGK</u> +
<i>Orbea longidens</i>	<u>KIEL</u> , <u>NBGK</u> +, <u>PRE</u> +
<i>Orbea maculata</i>	<u>KIEL</u> , <u>NBGK</u> +
<i>Orbeanthus conjunctus</i>	<u>KIEL</u> , <u>NBGK</u> +, <u>PRE</u> +
<i>Orbeanthus paradoxa</i>	<u>KIEL</u> , <u>NBGK</u> +
<i>Orbeopsis gerstneri</i> ssp. <i>gerstneri</i>	<u>NBGK</u> +
<i>Orbeopsis gerstneri</i> subsp. <i>elongata</i>	<u>PRE</u> +
<i>Stapelia barklyi</i>	<u>KIEL</u> , <u>PRE</u> , ZSS
<i>Stapelia cincta</i>	<u>KIEL</u>
<i>Stapelia clavicorona</i>	bgaas, <u>KIEL</u> , <u>PRE</u> , ZSS
<i>Stapelia concinna</i> var. <i>concinna</i>	<u>KIEL</u> , ZSS
<i>Stapelia conformis</i>	br, K, <u>KIEL</u> , <u>NBGK</u> +
<i>Stapelia divaricata</i>	<u>KIEL</u> , <u>NBGK</u> +
<i>Stapelia erectiflora</i>	ASH, br, gb, <u>KIEL</u> , <u>NBGK</u> +, RIG
<i>Stapelia glanduliflora</i>	bgaas, KALI, <u>KIEL</u> , <u>NBGK</u> +, <u>PRE</u> , RV
<i>Stapelia immelmaniae</i>	<u>KIEL</u> , <u>NBGK</u> +, teg
<i>Stapelia macowanii</i>	<u>KIEL</u> , ZSS

<i>Stapelia neliana</i>	<u>PRE</u>
<i>Stapelia nouhuysii</i>	br, <u>KIEL</u> , <u>NBGK+</u> , NCY, <u>PRE</u> , ZSS
<i>Stapelia rubiginosa</i>	<u>KIEL</u> , <u>NBGK+</u> , <u>PRE</u> , ZSS
<i>Stapelia thudichumii</i>	<u>NBGK</u>
<i>Stapelia umbonata</i>	<u>KIEL</u> , DUSS
<i>Stapelia villetae</i>	<u>KIEL</u> , <u>NBGK+</u> , <u>PRE</u> , ZSS
<i>Stapeliopsis neronis</i>	<u>KIEL</u> , <u>NBGK</u> , <u>PRE</u>
<i>Trichocaulon alstoni</i>	<u>K</u> , <u>PRE</u> , <u>ZSS</u>
<i>Trichocaulon annulatum</i>	<u>KIEL</u> , <u>NBGK</u>
<i>Trichocaulon cinereum</i>	<u>NBGK</u>
<i>Trichocaulon keetmanshoopense</i>	BOCH, <u>PRE</u> , ZSS
<i>Trichocaulon kubusense</i>	<u>PRE</u> , ZSS
<i>Trichocaulon pictum</i>	ZSS
<i>Trichocaulon pillansii</i>	<u>KIEL</u> , <u>NBGK</u>
<i>Trichocaulon truncatum</i>	<u>PRE</u>
<i>Tridentea baylissii</i>	<u>KIEL</u> , <u>NBGK+</u> , <u>PRE</u>
<i>Tridentea choanantha</i>	<u>KIEL</u> , <u>NBGK+</u>
<i>Tridentea longii</i>	<u>KIEL</u> , <u>NBGK+</u>
<i>Tridentea parvipuncta</i>	<u>PRE</u>
<i>Tridentea umdausensis</i>	<u>KIEL</u> , <u>NBGK+</u> , <u>PRE</u> , ZSS
CAMPANULACEAE	
<i>Wahlenbergia annuliformis</i>	sasy+
CELASTRACEAE	
<i>Cassine crocea</i>	NBG
COMPOSITAE	
<i>Felicia elongata</i>	AD+

<i>Gerbera aurantiaca</i>	<u>NBG</u> , <u>NBGN</u>
<i>Gerbera parva</i>	e
<i>Oldenbergia arbuscula</i>	<u>NBG</u> , <u>PRE</u>
<i>Senecio coleophyllus</i>	<u>NBG</u>
CRASSULACEAE	
<i>Cotyledon heterophylla</i>	<u>NBG</u>
<i>Cotyledon rubrovenosa</i>	B, <u>NBG</u> , ZSS
<i>Crassula arborescens</i> subsp. <i>undulatifolia</i>	ASH+, dsu, kiel, lecb, MHA, NOVB, <u>PRE</u> , SVER+, TAD+, tcd, zss
<i>Crassula barbata</i> subsp. <i>broomii</i>	<u>PRE</u> , SDAP
<i>Crassula fusca</i>	b, <u>CGG</u> , kiel, <u>NBGK+</u> , zss
<i>Crassula namaquensis</i> subsp. <i>comptonii</i>	<u>K</u> , <u>NBGK+</u> , <u>PRE</u> , ZSS
<i>Crassula planifolia</i>	<u>NBG</u> , <u>ZSS</u>
<i>Crassula socialis</i>	ASH+, b, br, CGG+, dbn+, duss, E, GB+, GBG, goet, GORK+, hlu, k, KALI+, kaun+, khar, kiel, LE, lecb, mha, mil, MO, MSK+, MTJB, NBG, ncy, ORT+, <u>PRE</u> , RIG+, RIGA+, rng, rv+, tall, u, WAHO, wi, zss
<i>Crassula subulata</i> var. <i>hispida</i>	SVER+
<i>Crassula susannae</i>	<u>B</u> , br, goet, kiel, MIL, MO, SDAP, u, WAHO, ZSS
<i>Crassula vestita</i>	<u>NBGK+</u>
<i>Kalanchoe alticola</i>	<u>NBG</u> , ZSS
<i>Kalanchoe crundallii</i>	<u>PRE</u>
<i>Tylecodon cacalioides</i>	<u>NBG</u> , <u>PRE</u>
<i>Tylecodon fragilis</i>	<u>NBGK+</u> , ZSS
<i>Tylecodon pearsonii</i>	<u>NBGK+</u> , <u>PRE</u> , <u>RNG</u> , <u>ZSS</u>
<i>Tylecodon striatus</i>	<u>NBG</u> , <u>NBGK+</u>

CUCURBITACEAE

Gerrardanthus tomentosus kiel

EBENACEAE

Euclea linearis NBGL

ERICACEAE

Erica alfredii NBG

Erica annectens NBG

Erica chrysocodon NBG+

Erica comptonii NBG

Erica dulcis NBG

Erica fairii NBG

Erica ferrea NBG

Erica heleogena NBG

Erica jasminiflora NBG

Erica junonia BRES, E, NBG+

Erica pillansii PALZ, NBG, NBGH+

Erica porteri NBG, nbgh+

Erica sociorum NBG

Erica turgida b, NBG, PRE

Erica urna-viridis NBG

Erica verticillata b, e, K, LE, npnz, PALZ, TRES

Erica vestiflua SDAP

EUPHORBIACEAE

Euphorbia barnardii b, PRE, ROT

Euphorbia clivicola PRE

Euphorbia fasciculata b, NBG, ROT, zss

Euphorbia grandialata NBGL, PRE, ZSS

<i>Euphorbia groenewaldii</i>	amd, boch+, goet, kiel, <u>PRE</u> , ROT, ZSS
<i>Euphorbia hallii</i>	ZSS
<i>Euphorbia marlothiana</i>	GB, <u>NBG</u> , ROT, ZSS
<i>Euphorbia nesemannii</i>	boch, br, K, <u>NBGK+</u> , ROT, ZSS
<i>Euphorbia perangusta</i>	<u>PRE</u>
<i>Euphorbia restricta</i>	<u>PRE</u> , SDAP
<i>Euphorbia tortirama</i>	boch, kiel, MIL, MO, <u>NBGK+</u> , <u>PRE</u> , ZSS
<i>Euphorbia waterbergensis</i>	NCY, <u>PRE</u> , ZSS
<i>Euphorbia zoutpansbergensis</i>	K, <u>NBG</u> , <u>PRE</u> , ROT

GESNERIACEAE

<i>Streptocarpus wendlandii</i>	bg, boch, br, DBN+, E, GB+, GBG, K, kiel, l, MW+, MHA, NCY, nij, u
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GRAMINEAE

<i>Arundinaria tessellata</i>	<u>NBG</u> , <u>NBGB</u> , <u>NBGD</u>
<i>Secale africanum</i>	<u>NBG</u>

GREYIACEAE

<i>Greyia flanaganii</i>	<u>NBG</u>
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IRIDACEAE

<i>Aristea lugens</i>	<u>UBC+</u>
<i>Babiana cedarbergensis</i>	AD, NBG
<i>Babiana striata</i> var. <i>planifolia</i>	<u>NBG</u>
<i>Dierama pulcherrimum</i>	ad+, b, CGG, DBN+, hlu, k, NPNZ+, tcd, tres+, UBC+, yalt
<i>Dietes bicolor</i>	b, BERN, CGG, hk+, K, le, MHA, <u>NBG</u>
<i>Dietes butcheriana</i>	<u>NBG</u> , PRE
<i>Geissorhiza mathewsii</i> var. <i>mathewsii</i>	NBG

<i>Gladiolus aureus</i>	<u>K</u> , <u>NBG</u> +
<i>Gladiolus buckerveldii</i>	AD
<i>Gladiolus cardinalis</i>	LEVAV, <u>NBG</u>
<i>Gladiolus carinatus</i> subsp. <i>parviflorus</i>	<u>NBG</u>
<i>Gladiolus citrinus</i>	NBG
<i>Gladiolus gracilis</i> var. <i>latifolius</i>	LEVAV, <u>NBG</u>
<i>Gladiolus gueinzii</i>	SDZO+
<i>Gladiolus lewiseae</i>	AD+
<i>Gladiolus oppositiflorus</i> subsp. <i>oppositiflorus</i>	K, <u>NBGN</u>
<i>Gladiolus oppositiflorus</i> subsp. <i>salmoneus</i>	<u>E</u>
<i>Gladiolus quadrangulus</i>	AD+, <u>NBG</u> +, SDZO+
<i>Gladiolus virescens</i> var. <i>rosea-venosus</i>	<u>NBG</u>
<i>Gladiolus viridiflorus</i>	AD+, <u>LEVAV</u>
<i>Homoglossum guthriei</i>	<u>NBG</u>
<i>Homoglossum merianellum</i> var. <i>merianellum</i>	<u>NBG</u>
<i>Ixia curta</i>	<u>NBG</u>
<i>Ixia framesii</i>	<u>NBG</u>
<i>Ixia maculata</i> var. <i>maculata</i>	NBG+, SDAP, yalt
<i>Ixia patens</i> var. <i>patens</i>	E
<i>Ixia viridiflora</i>	b, K, NBG, NPNZ+, tres+, UBC+
<i>Moraea aristata</i>	K, <u>NBG</u>
<i>Moraea gigandra</i>	NBG

Moraea insolens	<u>NBG</u>
Moraea loubseri	<u>NBG+</u> , <u>PRE</u> , SDZO+
Romulea multisculcata	<u>K</u>
Romulea saldanhensis	<u>K</u>
Sparaxis pillansii	<u>NBG</u>
Sparaxis tricolor	b, br, <u>K</u> , le, <u>NBG</u> , NY, tres+
Tritoniopsis elongata	<u>NBG</u>
Watsonia fergusoniae	<u>NBG</u>
Watsonia hysternantha	<u>NBG</u>
Watsonia rosea-alba	<u>NBG</u>

LAURACEAE

Cryptocarya wyliei	<u>NBG</u>
Ocotea kenyensis	<u>NBGL</u>

LEGUMINOSAE

Acacia hebeclada subsp. chobiensis	PRE
Acacia montis-usti	PRE
Erythrina decora	PRE, <u>WAI</u>
Umtiza listerana	<u>NBG</u> , nbgk+

LILIACEAE

Agapanthus walshii	<u>NBG</u>
Aloe albida	<u>NBG</u> , SDZO
Aloe angelica	b, br, K, <u>NBG</u> , <u>NBGK+</u> , <u>NBGL</u> , <u>PRE</u> , pru, SDZO, tres+, ZSS
Aloe buhrii	K, <u>NBG+</u> , <u>NBGK</u> , <u>PRE</u> , pru
Aloe distans	ad, ASH, b, br, dsu, K, KALI, khar, kiel, KPABG, lecb, MHA, mw+, NCY, oulu, pru, RV+, sbt, tall, ZSS

<i>Aloe gerstneri</i>	AD, <u>PRE</u> , pru, SDZO
<i>Aloe graciliflora</i>	<u>PRE</u>
<i>Aloe greenii</i>	ASH, br, dsu, E, gbg, K, lecb, MTJB, <u>NBGK</u> , <u>PRE</u> , pru, RIG, TALL
<i>Aloe karasbergensis</i>	b, e, kiel, kym, lecb, <u>NBG</u> , OULU, <u>PRE</u> , pru, TAD
<i>Aloe monotropa</i>	K, <u>NBGK+</u> , <u>PRE</u> , pru
<i>Aloe peglerae</i>	AD, b, K, <u>NBG</u> , <u>NBGK+</u> , <u>PRE</u> , pru, WAHO
<i>Aloe petrophila</i>	K, <u>NBG</u> , <u>NBGK+</u> , <u>PRE</u>
<i>Aloe polyphylla</i>	br, BRES, K, kiel, MIL, <u>NBG</u> , nbgd, <u>NBGK+</u> , NY, <u>PRE</u> , SDZO, ZSS
<i>Aloe pruinosa</i>	ASH, BLAN, K, <u>NBGK</u> , pru, TAD
<i>Aloe reynoldsii</i>	kiel, <u>NBG</u> , <u>NBGK+</u> , <u>PRE</u> , pru
<i>Aloe soutpansbergensis</i>	<u>PRE</u> , pru
<i>Aloe suffulta</i>	K, <u>NBG</u> , <u>PRE</u> , ZSS
<i>Aloe thornicrottii</i>	kiel, <u>NBG</u> , pru
<i>Aloe vandermerwei</i>	<u>NBGK</u>
<i>Aloe vogtsii</i>	AD, b, BRES, E, K, <u>NBG</u> , <u>NBGK</u> , <u>NBGL+</u> , <u>PRE</u> , pru, SDZO, TAD, ZSS
<i>Aloe vossii</i>	AD, <u>NBG</u> , <u>PRE</u> , pru
<i>Amphisiphon stylosa</i>	<u>NBG</u>
<i>Androsiphon capensis</i>	<u>NBG</u>
<i>Eucomis humilis</i>	TEG
<i>Eucomis vandermerwei</i>	<u>PRE+</u>
<i>Galtonia viridiflora</i>	E, K, <u>NBG</u> , NBGD
<i>Haworthia blackburniae</i>	K, khar, kiel, <u>NBG</u> , <u>NBGK+</u> , ZSS
<i>Haworthia koelmaniorum</i>	K, <u>NBGK+</u> , NBGL
<i>Haworthia marginata</i>	b, bak, goet, K, MSK+, <u>NBGK+</u> , <u>PRE</u> , SDAP, TEG+, WAHO, <u>ZSS</u>

Haworthia maughanii	b, boch, BR, <u>K</u> , kiel, MO, NBG, <u>NBGK+</u> , RIG, ROT, u, <u>ZSS</u>
Haworthia rubriflora	K, kiel, <u>NBGK+</u>
Haworthia springbokvlakensis	<u>NBGK+</u> , <u>PRE</u> , ZSS
Haworthia truncata	ad, boch, br, dbn+, goet, <u>K</u> , KAUN+, kiel, MIL, MTJB, <u>NBG</u> , <u>NBGK+</u> , NY, <u>PRE</u> , ROT, SDAP, teg+, u, <u>WAHO</u> , <u>ZSS</u>
Kniphofia citrina	BATU, E, sver
Kniphofia coralligemma	<u>K</u>
Kniphofia ensifolia subsp. autumnalis	cgg, <u>NBGD+</u> , <u>PRE</u>
Kniphofia flammula	batu, <u>K</u> , <u>PRE</u>
Kniphofia latifolia	<u>K</u>
Kniphofia litoralis	<u>PRE</u>
Kniphofia pauciflora	BRES ,
Kniphofia rooperi	AD, batu, E, <u>K</u> , PRE
Kniphofia rufa	batu, E, <u>NBGN</u>
Kniphofia thodei	<u>NBGD</u>
Kniphofia triangularis subsp. obtusiloba	K, UBC+
Kniphofia tysonii subsp. lebomboensis	<u>PRE</u>
Lachenalia convallarioides var. convallarioides	<u>NBG</u>
Lachenalia haarlemensis	TEG
Lachenalia purpureo-caerulea	LE, <u>NBG</u> , SDZO+
Lachenalia viridiflora	<u>NBG</u>
Massonia nervosa	<u>NBG</u>

MALPIGHIACEAE

Triaspis glaucophylla	pru
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MUSACEAE

Strelitzia juncea AD, BERN, kiel, MIL, NBG, NY, ort,
PRE, WAI

MYRSINACEAE

Myrsine pillansii PRE

MYRTACEAE

Heteropyxis canescens NBGL+

ORCHIDACEAE

Angraecum chamaeanthus NBGL+

Calanthe natalensis E, NBG, NBGL, NBGN, PRE

Eulophia leachii PRE

Eulophia litoralis livc

Mystacidium millarii NBG, NBGN

Stenoglottis longifolia B, BG+, br, CGG+, E, K, MTJB, NBG

PALMAE

Jubaeopsis caffra K, NBG, NBGL, PRE

Raphia australis NBG, NBGL, PRE

PROTEACEAE

Diastella buekii NBG

Leucadendron argenteum AD, boch, br, BRES, DUSS, kiel, MHA,
MW, NBG+, NBGH+, NPNZ+, PRE,
ORT+, SDAP, tres+

Leucadendron bonum NBG

Leucadendron burchellii AD+,

Leucadendron chamelaea AD+, NBG, ORT+

Leucadendron cinereum b, PRE, ORT+

Leucadendron comosum NBG
subsp. *homeophyllum*

Leucadendron concavum	<u>NBG</u>
Leucadendron cryptocephalum	<u>NBG</u>
Leucadendron discolor	ad+, DUSS, K, <u>NBG</u> , NPNZ+, PRE, SDAP, tres+
Leucadendron elimense subsp. elimense	<u>NBG</u>
Leucadendron elimense subsp. salteri	AD+, <u>NBG</u>
Leucadendron flexuosum	AD+, <u>NBG</u>
Leucadendron floridum	AD+, <u>NBG</u>
Leucadendron galpinii	AD, K, <u>NBG</u> , PRE
Leucadendron globosum	<u>NBG</u>
Leucadendron levisanus	AD
Leucadendron linifolium	AD+, b, <u>NBG</u>
Leucadendron macowanii	AD+, <u>NBG</u>
Leucadendron modestum	k, <u>NBG</u> , <u>ORT</u> +, PRE
Leucadendron nervosum	<u>NBG</u>
Leucadendron platyspermum	<u>NBG</u> , nbgh, tres+
Leucadendron radiatum	<u>NBG</u>
Leucadendron roodii	<u>NBG</u>
Leucadendron rourkei	AD+, NBG
Leucadendron stellare	<u>NBG</u>
Leucadendron stelligerum	<u>NBG</u>
Leucadendron thymifolium	<u>NBG</u>
Leucadendron tradouwense	<u>NBG</u>
Leucospermum arenarium	<u>NBG</u>
Leucospermum bolusii	<u>NBG</u> +, NPNZ

<i>Leucospermum cordatum</i>	<u>NBG</u> , PRE, tres+
<i>Leucospermum formosum</i>	K, <u>NBG</u>
<i>Leucospermum fulgens</i>	<u>NBG</u>
<i>Leucospermum glabrum</i>	ad+, <u>NBG</u>
<i>Leucospermum muirii</i>	ad+, br, <u>NBG</u> , NPNZ
<i>Leucospermum mundii</i>	<u>NBG</u>
<i>Leucospermum parile</i>	<u>NBG</u>
<i>Leucospermum pedunculatum</i>	<u>NBG</u>
<i>Leucospermum pluridens</i>	<u>NBG</u>
<i>Leucospermum praecox</i>	AD, <u>NBG</u>
<i>Leucospermum profugum</i>	<u>NBG</u>
<i>Leucospermum saxosum</i>	<u>NBG</u>
<i>Leucospermum tomentosum</i>	<u>NBG</u>
<i>Mimetes hottentoticus</i>	<u>NBG</u>
<i>Mimetes palustris</i>	<u>NBG</u>
<i>Mimetes splendidus</i>	<u>NBG</u>
<i>Orothamnus zeyheri</i>	<u>NBG</u>
<i>Protea angustata</i>	<u>NBG</u>
<i>Protea comptonii</i>	<u>NBG</u>
<i>Protea convexa</i>	DUSS, <u>NBG</u>
<i>Protea denticulata</i>	<u>NBG</u>
<i>Protea holosericea</i>	<u>NBG</u>
<i>Protea lanceolata</i>	AD+, b, <u>NBG</u>
<i>Protea minor</i>	K, <u>NBG</u>
<i>Protea odorata</i>	<u>NBG</u>
<i>Protea pityphylla</i>	<u>NBG</u>

<i>Protea pruinosa</i>	<u>NBG</u>
<i>Protea roupelliae</i> var. <i>hamiltonii</i>	<u>NBG</u> , nbgl
<i>Protea rubropilosa</i>	<u>NBG+</u> , <u>NBGL</u> , <u>ORT</u> , PRE
<i>Protea vogtsiae</i>	<u>NBG</u>
<i>Serruria brownii</i>	<u>NBG</u>
<i>Serruria ciliata</i>	<u>NBG</u> , <u>PRE</u>
<i>Serruria cyanoides</i>	<u>NBG</u>
<i>Serruria florida</i>	br, BRES, NBG, NPNZ+, PRE
<i>Serruria furcellata</i>	<u>NBG</u> , PRE
<i>Serruria incrassata</i>	<u>NBG</u>
<i>Serruria roxburghii</i>	<u>NBG</u>
<i>Serruria trilopha</i>	<u>NBG</u>
<i>Sorocephalus teretifolius</i>	<u>NBG</u>

RESTIONACEAE

<i>Chondropetalum acockii</i>	<u>NBG</u>
<i>Elegia fenestrata</i>	<u>NBG</u>
<i>Leptocarpus impolitus</i>	<u>NBG</u>
<i>Restio dodii</i> var. <i>dodii</i>	<u>NBG</u>
<i>Restio festucaeformis</i>	<u>NBG</u>
<i>Thamnochortus nutans</i>	<u>NBG</u>
<i>Thamnochortus punctatus</i>	<u>NBG</u>

RUBIACEAE

<i>Pavetta barbertonensis</i>	K
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RUTACEAE

<i>Acmadenia niveni</i>	<u>NBG</u>
<i>Agathosma thymifolia</i>	<u>NBG</u>

SAPINDACEAE

Atalaya capensis PRE

Erythrophysa transvaalensis NBG, PRE

SAPOTACEAE

Vitellariopsis dispar NBG

SCROPHULARIACEAE

Nemesia picta CGG

Nemesia strumosa kiel, RIGA, UBC+, VOR+, wi+

STERCULIACEAE

Dombeya autumnalis NBG, NBGL

Dombeya rotundifolia
var. *velutina* NBG

Sterculia alexandri NBG, PRE

ZINGIBERACEAE

Kaempferia aethiopica BR, NBGL+, PRE



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 6.

THE BOTANIC GARDENS LIST OF THREATENED TREE FERNS

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, February 1983

INTRODUCTION

Since September 1981 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of tree ferns for their annotations. The list is in two parts: a list of 333 taxa for the Old World, covering all species known to be rare or threatened as well as those whose conservation status is unknown, and a list of 84 rare and threatened taxa for the New World. So far we have received records for tree ferns in 49 gardens, but this covers only 36 species for the Old World Tree Ferns and 3 for the New World. This is a disappointing total, compared to say, Macaronesia, where we located 83 % of the threatened flora in cultivation, but it is only to be expected as we proceed from the commonly cultivated species to the less common ones. In the tree ferns it is clear that many gardens have plants of Dicksonia antarctica, a popular species, but few of the rarer and more unusual species are in cultivation. We still hope we may find gardens with some of these plants, and would welcome further records on threatened tree ferns, if possible for inclusion in the planned Botanic Gardens Green Book.

Fortunately, however, recent evidence supports the view that few of the tropical and temperate tree ferns are in danger of extinction. Many are plants of secondary habitats and so may be relatively safe, whereas others grow in upper montane forests, which are cleared less fast than the lowland forests. Many tree ferns occur on very steep and rather inaccessible slopes. A survey by Dr Clive Jermy at the British Museum (Natural History) suggests that many of the Asian species listed as Insufficiently Known will prove to be not threatened when more data become available. One reason for the special conservation interest in tree ferns is they are all on Appendix 2 of the Convention on Trade in Endangered Species of Wild Fauna and Flora, principally because some species may be threatened by trade in their trunks as a horticultural growing medium. The volume of this trade is uncertain, but it clearly affects only a small number of the species.

Ironically it may be that tree ferns are less threatened than other groups in the ferns. The International Association of Pteridologists (IAP) have recently set up a Working Group which, in close cooperation with the TPU, is planning a more effective monitoring of the conservation status of all ferns worldwide. This will be of great help to curators of botanic gardens in assessing the conservation value of their fern holdings.

This report gives the information we have to date. It is in two sections.

First is a list of the botanic gardens which hold material of the listed species, with their codes.

The second part is the list itself, giving the names of tree ferns so far identified as grown in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

The Royal Botanic Gardens, Kew, will be pleased to propagate and distribute to other members on request any of the species on the list held at Kew (identified by the symbol K).

Key

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

INDEX OF CODES

AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
AMD	Hortus Botanicus, University of Amsterdam, Plantage Middenlaan 2, 1018DD, AMSTERDAM, The Netherlands.
B	Botanischer Garten und Botanisches Museum Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BERN	Botanischer Garten der Universität, Altenbergrain 21, CH-3031 BERNE, Switzerland.
BG	Botanisk Hage, P.O. Box 12, N-5014 BERGEN, Norway.
BLAN	Jardin Botanico Marimurtra, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, MEISE B-1860, Belgium.
CGG	University of Cambridge Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, England.
CHRC	Christchurch Botanic Gardens, Parks and Recreation Department, City Council, P.O. Box 237, CHRISTCHURCH, New Zealand.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Republic of Ireland.
DELF	Cultuurtuin voor Technische Gewassen, Technische Hogeschool Delft, Julianalaan 67, Postbus 5057, 2600 GB DELFT, The Netherlands.
DUN	Dunedin Botanic Garden, Parks and Recreation Department, City Council, P.O. Box 5195, DUNEDIN, New Zealand.
DUSS	Botanischer Garten der Universität Düsseldorf, Universitätstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.
GB	Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GOTEBORG, Sweden.
GBG	Botanic Gardens, Glasgow G12 OUE, U.K.
GOET	Alter Botanischer Garten der Universität, Unter Karspüle 1, D-3400 GOTTINGEN, Federal Republic of Germany.
HK	Agriculture and Fisheries Department, 393 Canton Road, 12/F, KOWLOON, Hong Kong.

HKUS	Urban Services Department, 12th Floor West Wing, Central Government Offices, HONG KONG.
HLU	University of Hull Botanic and Experimental Garden, Thwaite Street, COTTINGHAM, Yorkshire, England.
K	Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England. (Including Wakehurst Place).
KIEL	Botanischer Garten der Universität, Olshausenstrasse 40-60, Biologiezentrum, D-2300 KIEL, Federal Republic of Germany.
LAU	Jardin Botanique de l'Université et de la Ville de Lausanne, 14bis Avenue de Cour, CH-1007 LAUSANNE, Switzerland.
LE	Botanical Garden of the Komarov Botanical Institute, Professor Popov Street 2, 197022, LENINGRAD 22, U.S.S.R.
LIVC	Liverpool Botanic Gardens, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
LIVU	University of Liverpool Botanic Gardens, Ness, NESTON, South Wirral L64 4AY, U.K.
MHA	Main Botanical Garden, Botanicheskaya Street 4, 127276 MOSCOW U-276, U.S.S.R.
MIL	Mitchell Park Conservatory, 524 South Layton Boulevard, MILWAUKEE, Wisconsin 53215, U.S.A.
MO	Missouri Botanical Garden, P.O. Box 299, ST LOUIS, Missouri 63166, U.S.A.
MTJB	Jardin Botanique de la Ville de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
MW	Botanical Garden of the Moscow Lomonosov State University, MOSCOW B-234, U.S.S.R.
NBG	National Botanic Gardens of South Africa, Kirstenbosch, Private Bag X7, CLAREMONT 7735, South Africa.
NCY	Jardins Botaniques de Nancy, 100 Rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NSM	Sum Yat-Sen Memorial Botanical Garden, NANJING, Kiangsu Province, China.
ORT	Jardin de Aclimatacion de la Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
PALZ	Ente Giardini Botanici Villa Taranto, I-28048 VERBANIA PALLANZA, Lago Maggiore, Italy.

PAV	Istituto et Orto Botanico dell Università di Pavia, Via San Epifanio 14, 27100 PAVIA, Italy.
PRE	Pretoria National Botanic Garden, Botanical Research Institute, Private Bag X101, PRETORIA, South Africa 001.
PRU	Department of Botany, University of Pretoria, PRETORIA 00002, South Africa.
SDAP	San Diego Wild Animal Park, Route 1, Box 725-E, ESCONDIDO, California 92025, U.S.A.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
TCD	Trinity College Botanic Garden, DUBLIN 2, Republic of Ireland.
TRES	Tresco Abbey Gardens, TRESCO, Isles of Scilly, Cornwall, U.K.
TUR	Botanical Garden, University of Turku, SF-20500 TURKU 50, Finland.
U	University Botanical Garden, Transitorium 2, Heidelberglaan 2, 3508-TC UTRECHT, The Netherlands.
UBC	Botanical Garden, University of British Columbia, 6501 Northwest Marine Drive, VANCOUVER B.C., Canada V6T 1W5.
WAI	Waimea Arboretum and Botanical Garden, Waimea Falls Park, Park Office, 59-864 Kamehameha Highway, HALEIWA 96712, Hawaii, U.S.A.
XAL	Jardin Botanico Fco. J. Clavijero, INIREB, Apartado Postal 63, XALAPA, Veracruz, Mexico.

TREE FERN HOLDINGS IN BOTANIC GARDENS

NEW WORLD SPECIES

CYATHEACEAE

<i>Cibotium schiedei</i>	AD, amd, b, BERN, BR, DELF, e, k, KIEL, LAU, LE+, MHA+, mil, MTJB, ort+, PRE, SDZO, tcd, U, UBC+
<i>Cnemidaria roraimensis</i>	<u>K</u>
<i>Trichipteris bicrenata</i>	<u>XAL</u>

OLD WORLD SPECIES

CYATHEACEAE

<i>Culcita villosa</i>	<u>K</u>
<i>Cyathea australis</i> ssp. <i>australis</i>	AD, <u>BOCH+</u> , DUSS, GB, goet, LIVC, MHA, mw, NCY, ort+, TUR, wai
<i>Cyathea borbonica</i> var. <i>borbonica</i>	BR
<i>Cyathea brachphylla</i>	<u>CGG+</u> , <u>K</u>
<i>Cyathea brownii</i>	AD
<i>Cyathea capensis</i>	<u>NBG+</u>
<i>Cyathea chinensis</i>	<u>NSM</u>
<i>Cyathea dregei</i> var. <i>dregei</i>	<u>NBG+</u> , PRU
<i>Cyathea excelsa</i>	dbn
<i>Cyathea fugax</i>	<u>K</u>
<i>Cyathea glauca</i>	<u>BR</u>
<i>Cyathea hainanensis</i>	<u>NSM</u>
<i>Cyathea hancockii</i>	<u>HK</u> , <u>NSM</u>
<i>Cyathea henryi</i>	<u>NSM</u>
<i>Cyathea hookeri</i>	amd
<i>Cyathea lepifera</i>	<u>HK</u> , <u>K</u> , <u>NSM</u>
<i>Cyathea lurida</i>	<u>K</u>

<i>Cyathea medullaris</i>	AD, <u>BR</u> , CGG+, <u>CHRC</u> +, dun+, GBG, livc, NCY, pav, pre, SDZO
<i>Cyathea mertensiana</i>	<u>WAI</u>
<i>Cyathea metteniana</i>	<u>NSM</u>
<i>Cyathea nilgirensis</i>	<u>K</u>
<i>Cyathea novae-caledoniae</i>	<u>MTJB</u>
<i>Cyathea pectinata</i>	<u>NSM</u>
<i>Cyathea petiolulata</i>	<u>NSM</u>
<i>Cyathea pseudogigantea</i>	<u>NSM</u>
<i>Cyathea raciborskii</i>	<u>E</u>
<i>Cyathea ramispina</i>	<u>K</u>
<i>Cyathea robusta</i>	tres (subject to verification)
<i>Cyathea sangirensis</i>	<u>K</u>
<i>Cyathea sechellarum</i>	<u>K</u>
<i>Cyathea spinulosa</i>	<u>HK</u> , hkus, <u>NSM</u> , ORT
<i>Cyathea squamulata</i>	<u>K</u>
<i>Cyathea tinganensis</i>	<u>NSM</u>
<i>Cyathea tsangii</i>	<u>NSM</u>
<i>Dicksonia antarctica</i>	ad, b, bg, BLAN, CGG+, DBN, GB, gbg+, hlu+, K, LAU, LE, LIVC, livu, mil, MO, MTJB, nbg+, ORT+, PALZ, PRE, SDAP, SDZO, tres+, TUR
<i>Dicksonia youngiae</i>	AD, UBC+



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 7.

THE BOTANIC GARDENS LIST OF THREATENED SPECIES FOR THE SOUTH ATLANTIC ISLANDS

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, February 1983

INTRODUCTION

Since May 1981 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a partial list of rare and threatened plants of the South Atlantic Islands, for their annotations. The list covered only 65 species - 10 for Ascension Island, 41 for St Helena, 8 for the Tristan de Cunha Group, 5 for the Falkland Islands and 1 for Tierra del Fuego. The information is comprehensive for St Helena, the island with by far the biggest endemic flora in the region; however, there may well be further rare and threatened species on the Sub-antarctic islands, especially among the species shared between several islands, as well as among the single-island endemics. As predicted, very few of the species are in cultivation: we have located in gardens only 11 of the 65 species. We would of course welcome any further records, if possible for inclusion in the planned Botanic Gardens Green Book.

St Helena, with 41 threatened endemics, clearly is the conservation priority. Recently the Fauna and Flora Preservation Society created a subcommittee on St Helena; this had a most successful meeting at Reading University and planned a programme of action to conserve the endemic flora. They were especially encouraged by the spate of so-called 'Extinct' species being rediscovered on the island, most of which we have documented in our Newsletter. The ffPS has sponsored a visit to St Helena by Mr Quentin Cronk, who is carrying out an ecological survey of the habitats of some of the endemic plants and studying the possibility of their conservation in situ. Unfortunately soil erosion has meant that many of the endemic plants no longer flourish in their native habitats and it is now too late to restore native ecosystems. In fact some endemics will only survive outside the island. The U.K. Foreign and Commonwealth Office in collaboration with the Forestry Commission, have kindly paid for Simon Goodenough, a skilled Kew propagator, to visit St Helena with Mr Cronk, to help develop the small botanic garden there and to bulk up the endemics, both for cultivation on the island and for bringing back to Kew, where the aim is to increase them and make them available to other botanic gardens. We see this as a valuable test of how the Botanic Gardens Conservation Co-ordinating Body can work in promoting the conservation of endangered plants by cultivation and helping the botanic gardens of the world to develop as a conservation network.

This report gives the information we have to date. It is in two sections.

First is a list of the botanic gardens which hold material of the listed species, with their codes.

The second part is the list itself, giving the names of threatened species from the South Atlantic so far identified as grown in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

As described above, the Royal Botanic Gardens, Kew, is working with authorities in St Helena to bring the remaining threatened species of that island into cultivation, and make them available for other gardens in the network.

Key

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

INDEX OF CODES

B	Botanischer Garten und Botanisches Museum Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BRES	Conservatoire Botanique du Stangelarc'h, 29300 BREST, France.
CGG	University of Cambridge Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
DELF	Cultuurtuin voor Technische Gewassen, Technische Hogeschool, Julianalaan 67, Postbus 5057, 2600 GB DELFT, Holland.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH, EH3 5LR, U.K.
K	Royal Botanic Gardens, KEW, Richmond, Surrey, TW9 3AE, U.K.
NCY	Jardins Botaniques de Nancy, 100 Rue de Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
TBI	Tbilisi Central Botanical Garden, 380005 TBILISI, P.O. 5. Georgian S.S.R., USSR.
UPS	Botanical Garden of Uppsala, Villavagen 8, S-75236 UPPSALA, Sweden.
ZSS	Stadtische Sukkulentsammlung, Mythenquai, CH-8002, ZURICH, Switzerland.

HOLDINGS OF RARE AND THREATENED PLANTS OF THE SOUTH ATLANTIC
IN BOTANIC GARDENS

PTERIDOPHYTA

MARATTIACEAE

Marattia purpurascens BRES+

ANGIOSPERMAE

CAMPANULACEAE

Wahlenbergia angustifolia BRES+, K, NCY

COMPOSITAE

Commidendrum robustum BRES, CGG+, K

Commidendrum rugosum BRES, CGG+, K

Melanodendron integrifolium K

CRUCIFERAE

Arabis macloviana K

EUPHORBIACEAE

Euphorbia organoides tbi

GERANIACEAE

Pelargonium cotyledonis B, BRES, CGG, delf, E, NCY, UPS, ZSS

PORTULACACEAE

Calandrinia feltonii bres+, K

STERCULIACEAE

Trochetiopsis erythroxylon BRES, CGG+, K, SDZO
(Trochetia erythroxylon)

Trochetiopsis melanoxylon CGG
(Trochetia melanoxylon)



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BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 8

THE BOTANIC GARDENS LIST OF NEW ZEALAND THREATENED SPECIES

1983

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, November 1983

INTRODUCTION

Since 1981 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of rare and threatened plants of New Zealand for their annotations. The list contains 225 taxa, threatened on a world scale, that are endemic to mainland New Zealand and offshore islands. So far 96 taxa have been reported in cultivation. Considering the long established tradition of New Zealand gardens growing native plants and the well known horticultural importance of much of the New Zealand flora this is a surprisingly low number of threatened taxa in cultivation. Many popular temperate garden plants hail from the islands, such as the endangered Lobster Claw Clianthus puniceus (found in 21 gardens in our survey) and the showy Fuchsia procumbens, which holds the record for being the most widely cultivated threatened plant of New Zealand among members of the 'Body'. One genus is surprisingly well represented in cultivation. Out of 16 Hebes on our original list, 15 have so far been reported to us in cultivation. Unfortunately our survey has not to date turned up the Extinct Hebe breviracemosa of the Kermadecs, but does at least point the value of botanic gardens and other plant collections toward conserving threatened species.

Mention should be made at this point of the outstanding work of many local botanists and horticulturists toward the conservation of New Zealand's flora. In particular we are very grateful to David Given of DSIR whose publication Rare and Endangered Plants of New Zealand (Reed Publishers, 1981) has set something of a precedent for those engaged in documenting threatened plants and plant habitats. This publication also provided the basis for the list which was circulated to members of the 'Body'. It is encouraging that such efforts toward identifying threatened plants are continuing. Our survey suggests that there is still a need to bring as yet unprotected species into cultivation. Members of the 'Body' clearly have a key role to play in growing and propagating rare and endangered New Zealand flora.

Hugh Syngé

This report gives the information we have to date. It is in two sections.

The first part is the list that gives the names of threatened species from New Zealand so far identified as grown in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

Second are the names and addresses of the botanic gardens which hold material of the listed species, with their codes.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and will help to remove pressure on wild populations.

The Royal Botanic Gardens, Kew (code K) will be pleased to propagate and distribute to other members on request any species marked on the list as growing at Kew.

K e y

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

RARE AND THREATENED PLANTS OF NEW ZEALAND

PTERIDOPHYTA

DAVALLIACEAE

Davallia tasmanii Field ad, BRES, DUN, NPNZ+, TIM

LOXSOMACEAE

Loxsoma cunninghamii R.Br. ex Cunn. AD, K, NPNZ+

ANGIOSPERMAE

ARALIACEAE

Pseudopanax ferox Kirk AD, CHRC, dbn, DUN+, DUSS, k, MTJB, SDZO, TIM+

Pseudopanax macintyreii (Cheeseman) Wardle dun+, K

Stilbocarpa lyallii J.Armstr. NPNZ, TIM

BIGNONIACEAE

Tecomanthe speciosa W.Oliver BRES, dun, E, K, NPNZ+, tim, WSY

BORAGINACEAE

Myosotidium hortensia (Decne.) Baillon AD, CHEL, CHRC, dun, E, GB, LIVC, npnz+, tim

Myosotis arnoldii L.Moore BRES, CHRC, E, K

Myosotis colensoi (Kirk) J.F.Macbr. CHRC, E, K, KIEL, LAU, TIM

Myosotis oreophila Petrie CHRC

CAMPANULACEAE

Pratia physaloides (A.Cunn.) Hemsley AD, npnz+

COMPOSITAE

Cassinia amoena Cheeseman NPNZ+

Celmisia hookeri Cockayne DUSS, E, UPS

Celmisia mackaui Raoul CHRC, DBN, DUN+, K, tim

Celmisia morganii Cheeseman NPNZ+

<u>Cotula nana</u> D.Lloyd	<u>TIM</u>
<u>Cotula pyrethrifolia</u> Hook.f. var. <u>linearifolia</u> Cheeseman	UPS
<u>Embergeria grandifolia</u> (Kirk) Boulos	<u>TIM</u>
<u>Ewartia sinclairii</u> (Hook.f.) Cheeseman	dun, <u>TIM</u>
<u>Gnaphalium nitidulum</u> Hook.f.	<u>K</u>
<u>Helichrysum dimorphum</u> Cockayne	<u>TIM</u>
<u>Helichrysum plumeum</u> Allan	alta, <u>DUN</u> , E, GB, K, <u>TIM</u>
<u>Helichrysum selago</u> (Hook.f.) Benth & Hook.f. var. <u>tumidum</u> Cheeseman	<u>CHRC</u> , E, <u>TIM</u>
<u>Olearia pachyphylla</u> Cheeseman	<u>CHRC</u> , DBN, dun+, NPNZ+
<u>Olearia semidentata</u> Decne. ex Hook.f.	DBN, e, K, palz, WSY
<u>Olearia traversii</u> (F.Muell.) Hook.f.	BRES, <u>CHRC</u> , dbn, dun+, e, K, nnpz+, tcd, tim
<u>Senecio compactus</u> Kirk	AD, BRES, CHEL, <u>CHRC</u> , E, npnz+
<u>Senecio huntii</u> F.Muell.	BRES, CHEL, E, K, npnz+, <u>TIM</u> , wsy
<u>Senecio perdicioides</u> Hook.f.	chrc, dun+, NPNZ+, tim
<u>Senecio saxifragoides</u> Hook.f.	<u>K</u> , <u>TIM</u>
<u>Senecio sciadophilus</u> Raoul	<u>CHRC</u> , <u>TIM</u>
<u>Senecio turneri</u> Cheeseman	<u>NPNZ+</u>

CORNACEAE

<u>Corokia macrocarpa</u> Kirk	ad, CHRC, <u>DUN+</u> , E, K, NPNZ+, tim
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CYPERACEAE

<u>Desmoschoenus spiralis</u> (A.Rich.) Hook.f.	<u>NPNZ+</u>
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EPACRIDACEAE

<u>Cyathodes robusta</u> Hook.f.	<u>DUN</u> , DUSS, e, gbg, <u>K</u> , <u>TIM</u>
<u>Dracophyllum viride</u> W.Oliver	tim

EUPHORBIACEAE

Homalanthus polyandrus (Muell. Arg.)
Cheeseman npnz+

GENTIANACEAE

Gentiana chathamica Cheeseman DUN

GERANIACEAE

Geranium traversii Hook.f. CGG+, CHRC, K

GUNNERACEAE

Gunnera hamiltonii Kirk CHRC, dbn, DUSS, RNG+, TIM, UBC

ICACINACEAE

Pennantia baylisiana (W.Oliver) Baylis DUN, NPNZ+

LEGUMINOSAE

Carmichaelia appressa SImpson AD, CHRC, NPNZ, TIM+

Carmichaelia astonii SImpson CHEL, k, NPNZ, TIM

Carmichaelia compacta Petrie K, NPNZ, TIM

Carmichaelia kirkii Hook.f. dun+, k, tim+

Carmichaelia prona Kirk CHEL, E

Carmichaelia williamsii Kirk AD, B, CHRC, DBN, dun+, K, mel, NPNZ, tim+

Chordospartium stevensonii Cheeseman AD, BRES, CHEL, CHRC, dbn, dun+, E, K, RNG, tim+

Clianthus puniceus (Don) Sol. ex Lindley AD, BERN, BRES, CHEL, CHRC, DBN, dun+, DUSS, gbg, K, l+, LAU, livu+, MACF, MB+, mel, npnz+, tim, TUR, wsy, Z

Notospartium carmichaeliae Hook.f. AD, CHRC, dbn, dun+, GB, K, RNG, tcd, UBC+, WSY

Notospartium glabrescens Petrie AD, BRES, E, K, tim

Notospartium torulosum Kirk E, K, UPS

Swainsona novae-zelandiae Hook.f. K

LENTIBULARIACEAE

Utricularia novae-zelandiae Hook.f. k, MACF+

LILIACEAE

Astelia chathamica (Skottsb.) L.Moore CHRC, K, NPNZ

Bulbinella talbotii L.B.Moore K

Cordyline kaspar W.Oliver CHRC, dun, NPNZ+

Xeronema callistemon W.Oliver AD, BRES, CHRC, E, K, LIVC, npnz+, SDZO, tim

LOGANIACEAE

Mitrasacme montana Hook.f. ex Benth. K
var. helmsii Kirk

MYOPORACEAE

Myoporum laetum Forst.f. var. decumbens Simpson dun, TIM

MYRSINACEAE

Elingamita johnsonii Baylis BRES, DUN, E, K, LIVC, NPNZ+, TIM

Myrsine coxii Cockayne E

MYRTACEAE

Metrosideros carminea W.Oliver dun+, gbg, K, npnz+, SDZO, tim

ONAGRACEAE

Fuchsia procumbens R.Cunn. ex Cunn. AD, alta, AMD, B, BERN, boch, BR, CGG+, CHEL, chrc, dbn, DELF, dun, DUSS, E, GB, gbg+, goet, hlu+, k, kiel, l+, LAU, MTJB, npnz+, RNG+, tim+, UBC+, UPS, WAG, WAI, wsy, WTU

ORCHIDACEAE

Bulbophyllum tuberculatum Colenso NSW+

Thelymitra matthewsii Cheeseman CBG

PITTOSPORACEAE

<u>Pittosporum dallii</u> Cheeseman	BRES, CHRC, dbn, dun, E, K, LIVC, tim
<u>Pittosporum fairchildii</u> Cheeseman	BRES, <u>CHRC</u> , DBN, e, <u>K</u> , NPNZ+, tim
<u>Pittosporum michiei</u> Allan	<u>K</u> , NPNZ+, <u>TIM</u>
<u>Pittosporum obcordatum</u> Raoul	<u>CHRC</u> , dun
<u>Pittosporum pimeleoides</u> R.Cunn.	TIM
<u>Pittosporum turneri</u> Petrie	CHRC, DBN, dun
<u>Pittosporum virgatum</u> Kirk	<u>TIM</u>

RANUNCULACEAE

<u>Ranunculus crithmifolius</u> Hook.f. subsp. <u>paucifolius</u> (Kirk) F.Fisher	CGG+, <u>K</u> , TIM
<u>Ranunculus godleyanus</u> Hook.f.	<u>UBC</u>

RHAMNACEAE

<u>Pomaderris rugosa</u> Cheeseman	AD, chrc, dun+, E, K, mel
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RUBIACEAE

<u>Coprosma intertexta</u> Simpson	<u>CHRC</u> , UPS
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SCROPHULARIACEAE

<u>Hebe acutiflora</u> Cockayne	AD, <u>CHRC</u> , dun, tim
<u>Hebe annulata</u> (Petrie) Cockayne & Allan	CHRC
<u>Hebe armstrongii</u> (J.Armstr.) Cockayne & Allan	AD, bern, <u>CHRC</u> , DELF, E, goet, hlu, K, kiel, <u>L</u> , LIVC, npnz+, palz, WSY, Z
<u>Hebe barkeri</u> (Cockayne) Cockayne	dun, <u>TIM</u> , WSY
<u>Hebe biggarii</u> Cockayne	dun
<u>Hebe cupressoides</u> (Hook.f.) Cockayne & Allan	AD, B+, CHEL, <u>CHRC</u> , dbn, DELF, dun, DUSS, e, <u>GBG</u> , k, <u>L</u> , LAU, MEL, npnz+, rng, tim+, ups, WSY, Z
<u>Hebe gibbsii</u> (Kirk) Cockayne & Allan	BRES, dbn, <u>E</u> , <u>K</u>
<u>Hebe imbricata</u> Cockayne & Allan	CHRC, dbn, tim

<u>Hebe insularis</u> (Cheeseman) Cockayne & Allan	AD
<u>Hebe macrocarpa</u> (Vahl) Cockayne & Allan var. <u>brevifolia</u> (Cheeseman) L.Moore	<u>CHRC</u> , tim
<u>Hebe poppelwellii</u> (Cockayne) Cockayne & Allan	K, L ^{IVC}
<u>Hebe ramosissima</u> Simpson & J.Thomson	E
<u>Hebe raoulii</u> (Hook.f.) Cockayne & Allan var. <u>maccaskillii</u> Allan	CHRC, <u>E</u> , K
<u>Hebe speciosa</u> (Cunn.) Cockayne & Allan	AD, amd+, B+, boch, CHEL, <u>CHRC</u> , ort+, <u>TIM</u> , WA, Z
<u>Hebe townsonii</u> (Cheeseman) Cockayne & Allan	AD, <u>CHRC</u> , dun+, goet, <u>K</u> , npnz+, tim
<u>Parahebe trifida</u> W.Oliver	E, tim+

SOLANACEAE

<u>Solanum aviculare</u> Forst.f. var. <u>latifolium</u> Baylis	<u>NIJ</u> +
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THYMELAEACEAE

<u>Pimelea arenaria</u> Cunn.	<u>K</u>
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UMBELLIFERAE

<u>Aciphylla dieffenbachii</u> Kirk	dun, TIM
<u>Aciphylla trifoliolata</u> Petrie	UPS

VERBENACEAE

<u>Teucrium parvifolium</u> Hook.f.	<u>CHRC</u> , mel, <u>TIM</u> +
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INDEX OF CODES

CODE

INSTITUTION

AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
ALTA	Devonian Botanic Garden, University of Alberta, Room B-414, Biological Sciences Centre, EDMONTON, Alberta T6G 2E9, Canada.
AMD	Hortus Botanicus of the University of Amsterdam, Plantage Middenlaan 2, 1018 DD AMSTERDAM, The Netherlands.
B	Botanischer Garten Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BERN	Botanischer Garten der Universitat, Altenbergrain 21, CH-3013 BERN, Switzerland.
BOCH	Botanischer Garten Ruhr-Universitat, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
BRES	Conservatoire Botanique de Stangelarc'h, 29200 BREST, France.
CBG	Canberra National Botanic Gardens, CANBERRA, A.C.T. 2601, Australia.
CGG	Cambridge University Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
CHEL	Chelsea Physic Garden, 66 Royal Hospital Road, LONDON SW3 4HS, U.K.
CHRC	Christchurch Botanic Gardens, Parks and Recreations Department, City Council, P.O. Box 237, CHRISTCHURCH, New Zealand.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Ireland.
DELF	Cultuurtuin voor Technisch Gewassen, Technisch Hogeschool Delft, Julianalaan 67, Postbus 5057, 2600 GB DELFT, The Netherlands
DUN	Dunedin Botanic Garden, Parks and Recreations Department, City Council, P.O. Box 5195, DUNEDIN, New Zealand.
DUSS	Botanischer Garten der Universitat Dusseldorf, Universitätsstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.
GB	Göteborg Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GÖTEBORG, Sweden.

GBG	Glasgow Botanic Gardens, GLASGOW G12 0UE, U.K.
GOET	Alter Botanischer Garten der Universitat, Untere Karspule 1, D-3400, GOTTINGEN, Federal Republic of Germany.
HLU	University of Hull Botanic & Experimental Garden, Thwaite Street, COTTINGHAM, Yorkshire, U.K.
K	Royal Botanic Gardens, Kew, RICHMOND, Surrey TW9 3AB, U.K.
KIEL	Botanischer Garten der Universitat Kiel, Olshausenstrasse 40-60, Biologiezentrum, D-2300 KIEL, Federal Republic of Germany.
L	Leiden University Botanic Garden, Nonnensteeg 3, 2311 VJ LEIDEN, The Netherlands.
LAU	Jardin Botanique de Lausanne, 14 bis, Avenue de Cour, CH-1007 LAUSANNE, Switzerland.
LIVC	Liverpool City Botanic Gardens, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
LIVU	University of Liverpool Botanic Gardens, Ness, NESTON, South Wirral L64 4AY, U.K.
MACF	Fullerton Arboretum, California State University, FULLERTON, California 92634, U.S.A.
MB	Botanischer Garten der Philipps-Universitat, Universitatstrasse Postfach 582, 3550 MARBURG, Federal Republic of Germany.
MEL	Royal Botanic Gardens, Melbourne, Birdwood Avenue, SOUTH YARRA, Victoria 3141, Australia.
MTJB	Jardin Botanique de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
NIJ	Botanic Garden of Nijmegen, University of Nijmegen, Department of Botany, Toernooiveld, NIJMEGEN, The Netherlands.
NPNZ	Pukekura Park, Parks and Recreations Department, City Council, Private Bag, NEW PLYMOUTH, New Zealand.
NSW	Royal Botanic Gardens, Mrs Macquaries Road, SYDNEY, New South Wales 2000, Australia.
ORT	Jardin de Aclimatacion de La Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
PALZ	Ente Giardini Botanici Villa Taranto, I-28048 VERBANIA PALLANZA, Lago Maggiore, Italy.

RNG	Plant Science Botanic Garden, Plant Science Laboratories, University of Reading, Whiteknights, READING RG6 2AS, U.K.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
TCD	Trinity College Botanic Garden, School of Botany, Trinity College, DUBLIN 2, Ireland.
TIM	Timaru Botanic Garden, Parks and Recreation Department, City Council, P.O. Box 522, TIMARU, New Zealand.
TUR	University of Turku Botanical Garden, SF-20500 TURKU 50, Finland.
UBC	Botanic Garden, University of British Columbia, 6501 Northwest Marine Drive, VANCOUVER, B.C., Canada V6T 1W5.
UPS	Uppsala Botanic Garden, Villavagen 8, S-75236 UPPSALA, Sweden.
WA	Warsaw University Botanic Garden, Al. Ujazdowskie 4, 00-478 WARSAW, Poland.
WAG	Belmonte Arboretum and Botanical Gardens, Agricultural University, Generaal Foulkesweg 37, 6703 BL WAGENINGEN, The Netherlands.
WAI	Waimea Arboretum & Botanical Garden, Park Office, 59-864 Kamehameha Highway, Haleiwa, HAWAII 96712, U.S.A.
WSY	The Royal Horticultural Society Garden, Wisley, Ripley, Woking, Surrey GU23 6QB, U.K.
WTU	University of Washington Arboretum, SEATTLE, Washington 98195, U.S.A.
Z	University of Zurich Botanic Gardens, Zollikerstrasse 107, CH-8008 ZURICH, Switzerland.



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 9

THE BOTANIC GARDENS LIST OF AUSTRALIAN THREATENED SPECIES

1983

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, November 1983

INTRODUCTION

Since 1982 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of rare and threatened plants of Australia for their annotations. The list covers all threatened endemic taxa including those of Lord Howe, Norfolk and Philip Island.

The flora of the Australian States and Territories includes approximately 15,000 vascular plant species, of which 80 per cent are endemic. Over 2000 taxa have been identified as either rare or threatened. The national list of threatened Australian plants was published in 1981 under the title Rare or Threatened Australian Plants (Australian National Parks and Wildlife Service Spec. Publ. 7) and was compiled by Drs J. Leigh, J. Briggs and W. Hartley. We are particularly grateful to them for allowing us to use the report as the basis for our list.

So far a total of 675 threatened Australian taxa have been reported in cultivation by members of the 'Body'. This is quite an impressive total representing just over 30 per cent of all threatened Australian plants. Many are of outstanding horticultural merit, and some genera are particularly well represented in cultivation. All 13 rare or threatened species of Banksia, for example, are in cultivation.

The conservation of Australia's threatened flora has benefited greatly from the long-established tradition of both Australian botanic gardens and private collections growing native plants. What is evident from the report is the number of species still represented in just a single garden. Here the 'Body' could further contribute to the long term survival of these plants by bulking up their stocks and distributing them to other members.

Hugh Synge

This report gives the information we have to date. It is in two sections.

The first part is the list that gives the names of threatened species from Australia so far identified as grown in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

Second are the names and addresses of the botanic gardens which hold material of the listed species, with their codes.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and will help to remove pressure on wild populations.

The Royal Botanic Gardens, Kew (code K) will be pleased to propagate and distribute to other members on request any species marked on the list as growing at Kew.

K e y

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

RARE AND THREATENED PLANTS OF AUSTRALIA

PTERIDOPHYTA

ASPIDIACEAE

<u>Dryopteris sparsa</u> (D.Don) Kuntze	ad, <u>HiK</u> , HKUS
<u>Lastreopsis grayi</u> D.Jones	<u>CBG</u> , MEL
<u>Lastreopsis nephrodioides</u> (Baker) Tind.	<u>K</u>
<u>Polystichum fragile</u> Watts	MEL
<u>Polystichum whiteleggei</u> Watts	MEL
<u>Tectaria devexa</u> (C.Chr.) Copel.	MTJB

ASPLENIACEAE

<u>Asplenium dimorphum</u> Kunze	AD, amd, b, BR, mb+, MHA
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BLECHNACEAE

<u>Blechnum ambiguum</u> (C.Presl) C.Chr.	AD, <u>CBG</u> , mel
<u>Blechnum fullageri</u> (F.Muell.) C.Chr.	<u>CBG</u>
<u>Blechnum gregsonii</u> (Watts) Tind.	<u>CBG</u> , MTJB
<u>Doodia maxima</u> J.Smith	cgg, k, LE
<u>Pteridoblechnum acuminatum</u> (C.White & Goy) Hennipman	<u>L+</u>

CYATHEACEAE

<u>Cyathea australis</u> (R.Br.) Domin subsp. <u>australis</u>	AD, BERN, <u>BOCH+</u> , <u>CBG+</u> , DUSS, FRP, GB, goet, K, <u>LIVC</u> , MB+, MHA, mw, NCY, <u>NSW+</u> , ort+, TUR, WAI
<u>Cyathea australis</u> (R.Br.) Domin subsp. <u>norfolkensis</u> Holttum	<u>AD</u>
<u>Cyathea baileyana</u> (Domin) Domin	<u>CBG+</u> , mel, <u>NSW</u>
<u>Cyathea brevipinna</u> Baker	<u>NSW</u>
<u>Cyathea brownii</u> Domin	AD
<u>Cyathea celebica</u> Blume	MEL
<u>Cyathea felinum</u> (Roxb.) Morton	<u>NSW</u>

Cyathea robusta (C.Moore) Holttum

AD, TRES

Dicksonia youngiae Hook. & Baker

AD, K, NSW+, UBC+

DAVALLIACEAE

Humata pectinata (J.Smith) A.Desv.

mel

DENNSTAEDTIACEAE

Hypolepis dicksonioides (Endl.) Hook.

AD

Oenotrichia dissecta (C.White & Goy)
S.Andrews

K

DICKSONIACEAE

Culcita villosa C.Chr.

E, K

HYMENOPHYLLACEAE

Hymenophyllum moorei Baker

K

LYCOPODIACEAE

Lycopodium carinatum Desv.

CBG, K

Lycopodium polytrichioides Kaulf.

BOCH

Lycopodium serratum Thunb.

HK, HKUS

Lycopodium squarrosum Forst.f.

b, BOCH, BR, CBG, CGG, FRP, goet,
K, MEL

Marattia salicina Smith subsp. nov.

K

OSMUNDACEAE

Leptopteris moorei (Baker) Christ

k

POLYPODIACEAE

Platycterium hillii T.Moore

AMD, b, CBG, DBN, E, KIEL, L+,
livc, MHA, mil, MTJB, MW, NCY,
RIGA, RNG, sdap, SDZO, u, wai

Platycterium veitchii (Underw.) C.Chr.

AMD, b, br, CBG, E, hlu, K, L+,
MEL, NCY, RNG, SDZO, u

GYMNOSPERMAE

ARAUCARIACEAE

Araucaria heterophylla (Salisb.)
Franco

AD, amd, BLAN, br, CBG, dbn, duss,
FRP, HK, HKUS, k, kpbg, LE, LECB,
lisjc+, livc, mel, mil, MSK, MTJB,
ort+, sdap, SDZO, TALL, tcd, teg,
tim, WAI

CUPRESSACEAE

Callitris oblonga A.Rich.

BATU, BR, CBG+, DBN, DUSS, E, FRP, K, MB, WAG

CYCADACEAE

Cycas cairnsiana F.Muell.

AD, AMD, CBG, DBN, FTG, LASCA+, SDZO, WAI

Cycas furfuracea W.Fitzg.

B

Cycas normanbyana F.Muell.

FTG

PODOCARPACEAE

Microstrobos fitzgeraldii (F.Muell.)
J.Garden & Johnson

AD, amd, BRES+, CBG+, DUSS, E

TAXODIACEAE

Athrotaxis laxifolia Hook.

amd, CBG+, DUSS, E, K, LIVC, UPS

ZAMIACEAE

Bowenia serrulata (W.Bull) Chamberlain

AD, FTG, LE, MTJB, SDZO, such, tbi, TUR

Bowenia spectabilis Hook. ex Hook.f.

AD, AMD, brist, FTG, l, m, NPNZ, pav, pru, Z

Lepidozamia hopei Regel

AD, CBG, FTG, K, WAI

Macrozamia diplomera (F.Muell.)
L.Johnson

AD, AMD, BR, FTG, LASCA+, pav, PRE, SDAP

Macrozamia fawcettii C.Moore

AD, FTG, LASCA+, SDAP

Macrozamia heteromera C.Moore

AD, CBG, FTG, LASCA, SDAP

Macrozamia lucida L.Johnson

AMD, CBG, chrc, FTG, l, LASCA+

Macrozamia macdonnellii (F.Muell. ex
Miq.) A.DC.

AD, FRP, FTG, K, LASCA+, mha, sdzo, STA

Macrozamia miquelii (F.Muell.) A.DC.

AD, AMD, CBG, dbn, FTG, l, LASCA+, LE, mel, MHA, NPNZ, SDAP, SDZO

Macrozamia moorei F.Muell.

AD, BR, CBG, e, FTG, LASCA+, LE, M, MTJB, PRE, SDAP, SDZO, srgh

Macrozamia platyrachis Bailey

CBG, E, FTG, LASCA+

Macrozamia riedlei (Fischer ex Gaudich.) Gardner

AD, BR, CBG, DBN, FTG, K, KPBG+, LASCA+, m, mel, MTJB, sdzo, SRGH, TUR

Macrozamia secunda C.Moore

AD, BR, FTG, KPBG, LASCA+, MO, mtjb, sdzo

Macrozamia spiralis (Salisb.) Miq.

AD, BOCH, BR, brist, CBG, DELF, e, FTG, HLU, kym, LASCA+, latt, LECB, m, mb, MTJB, NPNZ, pav, SBT, SDZO, WAG

Macrozamia stenomera L.Johnson

AD, CBG, FTG, LASCA, MO

ANGIOSPERMAE

AMARANTHACEAE

Achyranthes arborescens R.Br.

CBG, K

Ptilotus symonii Benl

CBG

APOCYNACEAE

Alyxia gynopogon Roemer & Schultes

cgg+

Alyxia lindii F.Muell.

K

Ochrosia moorei (F.Muell.) Benth.

AD

Parsonsia tenuis S.T.Blake

CBG

APONOGETONACEAE

Aponogeton hexatpalus H.Bruggen

KPBG

ARALIACEAE

Meryta angustifolia (Endl.) Seemann

AD

ASCLEPIADACEAE

Hoya macgillivrayi Bailey

AD, CBG, K, mel

AUSTROBAILEYACEAE

Austrobaileya maculata C.White

CBG

BIGNONIACEAE

Tecomanthe hillii (F.Muell.) Steenis

CBG

BYBLIDACEAE

Byblis gigantea Lindley

boch+, FRP, KPBG, mel

CALYCANTHACEAE

Idiospermum australiense (Diels)
S.T.Blake

LE, WAI

CAMPANULACEAE

Pratia irrigua (R.Br.) Benth.

CGG+, K, mb+, UPS, wsy

Wahlenbergia saxicola A.DC.

AD, K, mb+

CARTONEMATACEAE

Cartonema philydroides F.Muell.

KPBG

CASUARINACEAE

Casuarina ramosissima C.Gardner

AD

CELASTRACEAE

Elaeodendron curtispiculum Endl.

K

CENTROLEPIDACEAE

Hydatella australis Diels

KPBG

CHENOPODIACEAE

Tecticornia uniflora P.G.Wilson

KPBG+

COMBRETACEAE

Macropteranthes montana (F.Muell.)
F.Muell.

CBG

COMPOSITAE

Angianthus eriocephalus Benth.

k

Brachycome segmentosa C.Moore &
F.Muell.

CBG

Calocephalus aeruoides (F.Muell.)
Benth.

UPS

Ewartia planchonii (Hook.f.) Beauv.

K

Gnaphalium nitidulum Hook.f.

K

Helichrysum lindsayanum Domin

CBG+

<u>Helichrysum milliganii</u> Hook.f.	<u>K</u>
<u>Helichrysum selaginoides</u> (Sonder & F.Muell.) Benth.	CGG
<u>Helichrysum whitei</u> Burbidge	<u>CBG+</u>
<u>Humea cassiniiformis</u> (F.Muell.) J.Black	AD
<u>Ixodia angusta</u> (Wakef.) Burbidge	<u>K</u>
<u>Lordhowea insularis</u> (Benth.) R.Nordenstam	<u>CBG</u>
<u>Olearia ballii</u> (F.Muell.) Hemsley	<u>CBG</u>
<u>Olearia frostii</u> (F.Muell.) J.H.Willis	E, <u>K</u>
<u>Podolepis monticola</u> R.Henderson	<u>CBG+</u>
<u>Rutidosia leiolepis</u> F.Muell.	cbg+
<u>Rutidosia leptorrhynchoides</u> F.Muell.	<u>CBG+</u>
CONVOLVULACEAE	
<u>Porana sericea</u> (Gaudich.) F.Muell.	<u>CBG</u>
CORNACEAE	
<u>Corokia whiteana</u> L.S.Smith	<u>CBG+</u>
CRUCIFERAE	
<u>Lepidium drummondii</u> Thell.	<u>CBG+</u>
<u>Lepidium linifolium</u> (Desv.) Steudel	cbg+, <u>KPBG</u>
CYPERACEAE	
<u>Machaerina insularis</u> (Benth.) T.Koyama	<u>CBG</u>
<u>Reedia spathacea</u> F.Muell.	<u>KPBG</u>
DILLENIACEAE	
<u>Hibbertia bracteosa</u> Turcz.	<u>CBG</u> , MEL
<u>Hibbertia glaberrima</u> (Steudel) Gilg	<u>CBG</u> , MEL
<u>Hibbertia hermanniaefolia</u> DC.	<u>CBG</u>

<u>Hibbertia miniata</u> C.Gardner	AD, <u>CBG</u>
<u>Hibbertia saligna</u> DC.	<u>CBG</u>
<u>Hibbertia tomentosa</u> DC.	<u>CBG</u>

DROSERACEAE

<u>Drosera adelae</u> F.Muell.	AD, B, boch+, FRP, K, MTJB, tim
<u>Drosera prolifera</u> C.White	B, FRP
<u>Drosera schizandra</u> Diels	FRP

EPACRIDACEAE

<u>Epacris apiculata</u> A.Cunn.	<u>CBG</u>
<u>Epacris muelleri</u> Sonder	<u>CBG</u>
<u>Leucopogon neurophyllus</u> F.Muell.	<u>K</u>
<u>Richea curtisiae</u> A.M.Gray	<u>CBG</u>
<u>Rupicola gnidioides</u> Summerh.	<u>CBG</u>
<u>Rupicola sprengelioides</u> Maiden & E.Betche	<u>CBG</u>
<u>Wittsteinia vacciniacea</u> F.Muell.	<u>AD</u> , <u>CBG</u> , <u>E</u>

ERICACEAE

<u>Agapetes meiniana</u> F.Muell.	<u>CBG</u> , <u>E</u> , <u>LIVC</u> , mel
<u>Pernettya tasmanica</u> Hook.f.	AD, DBN, DUSS, E, <u>K</u> , MB+, UBC+
<u>Rhododendron lochae</u> F.Muell.	AD, <u>BOCH</u> , cbg, E, FRP, <u>K</u> , mel, tim

ESCALLONIACEAE

<u>Argophyllum lejourdanii</u> F.Muell.	<u>CBG</u>
<u>Argophyllum nullumense</u> R.Baker	<u>CBG</u>

EUCRYPHIACEAE

<u>Eucryphia moorei</u> F.Muell.	BRES, <u>CBG+</u> , DUSS, e
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EUPHORBIACEAE

<u>Bertya rotundifolia</u> F.Muell.	<u>CBG+</u>
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<u>Beyeria latifolia</u> (Muell.Arg.) Baillon	UPS
FAGACEAE	
<u>Nothofagus moorei</u> Krasser	<u>CBG+</u> , dbn, DUSS, k, mel, tcd
FRANKENIACEAE	
<u>Frankenia tetrapetala</u> Labill.	<u>CBG+</u>
GESNERIACEAE	
<u>Negria rhabdothamnoides</u> F.Muell.	<u>CBG</u>
GOODENIACEAE	
<u>Dampiera diversifolia</u> Vriese	AD+, <u>CBG+</u> , <u>KPBG</u> , mel
<u>Goodenia glomerata</u> Maiden & E.Betche	MEL
<u>Leschenaultia acutiloba</u> Benth.	ad+, <u>CBG+</u>
<u>Leschenaultia chlorantha</u> F.Muell.	<u>KPBG</u>
<u>Leschenaultia juncea</u> E.Pritzel	<u>CBG</u>
<u>Leschenaultia longiloba</u> F.Muell.	<u>CBG</u>
<u>Leschenaultia superba</u> F.Muell.	<u>CBG+</u> , <u>KPBG</u> , mel
<u>Scaevola bursariifolia</u> J.Black	UPS
GRAMINEAE	
<u>Danthonia occidentalis</u> Vick.	<u>CBG</u>
<u>Festuca plebeia</u> R.Br.	<u>K</u>
<u>Micraira compacta</u> Lazarides	<u>CBG</u>
<u>Micraira subulifolia</u> F.Muell.	<u>CBG</u>
HAEMODORACEAE	
<u>Macropidia fuliginosa</u> (Hook.) Druce	<u>KPBG+</u>
<u>Phlebocarya pilosissima</u> F.Muell.	<u>KPBG</u>
<u>Tribonanthes brachypetala</u> Lindley	<u>KPBG</u>

HALORAGACEAE

Gonocarpus longifolius (Schindler) CBG+
Orch.

Haloragodendron bauerlenii (F.Muell.) CBG+
Orch.

HERNANDIACEAE

Hernandia bivalvis Benth. AD, CBG, mel

IRIDACEAE

Dietes robinsoniana (C.Moore & CBG, E, k, mel, WAI
F.Muell.) Klatt

LABIATAE

Hemiandra gardneri O.Sarg. KPBG

Prostanthera cineolifera R.Baker & CBG+
H.G.Smith

Prostanthera cruciflora J.H.Willis AD, CBG+

Prostanthera cryptandroides Benth. CBG

Prostanthera decussata F.Muell. CBG

Prostanthera densa A.A.Ham. CBG

Prostanthera discolor R.Baker CBG+

Prostanthera eurybioides F.Muell. ad, CBG

Prostanthera staurophylla F.Muell. cbg, MEL

Prostanthera stricta R.Baker AD, CBG, mel

Prostanthera teretifolia Maiden & AD, MEL
E.Betche

Prostanthera walteri F.Muell. AD, CBG

Westringia lucida Boivin AD, CBG

LAURACEAE

Cryptocarya gregsonii Maiden CBG

Endiandra globosa Maiden & E.Betche CBG

LEGUMINOSAE

<u>Acacia adunca</u> G.Don	cbg
<u>Acacia aphylla</u> Maslin	<u>KPBG</u>
<u>Acacia araneosa</u> Whibley	AD
<u>Acacia barattensis</u> J.Black	<u>AD</u>
<u>Acacia bynoeana</u> Benth.	<u>AD</u>
<u>Acacia curranii</u> Maiden	<u>CBG</u>
<u>Acacia dempsteri</u> F.Muell.	<u>KPBG+</u>
<u>Acacia denticulosa</u> F.Muell.	AD, <u>CBG</u> , MEL
<u>Acacia dodonaeifolia</u> Sprengel	BRES, MEL
<u>Acacia dura</u> Benth.	<u>AD</u>
<u>Acacia enterocarpa</u> R.V.Smith	<u>AD</u> , mel
<u>Acacia gillii</u> Maiden & Blakely	<u>AD</u>
<u>Acacia glandulicarpa</u> Reader	AD
<u>Acacia glaucoptera</u> Benth.	<u>CBG</u> , DUSS, <u>KPBG+</u> , mel
<u>Acacia gnidium</u> Benth.	<u>AD</u> , cbg, MEL
<u>Acacia gracilifolia</u> Maiden & Blakely	AD+, <u>CBG</u> , DBN, mel
<u>Acacia howittii</u> F.Muell.	AD, BR, CBG+, MEL
<u>Acacia imbricata</u> F.Muell.	<u>AD</u> , LE
<u>Acacia iteaphylla</u> Benth.	<u>CBG</u> , DBN, KAUN, mel
<u>Acacia megacephala</u> Maslin	ad
<u>Acacia meisneri</u> Meissner	AD+, <u>KPBG</u> , MEL
<u>Acacia menzelii</u> J.Black	<u>AD</u>
<u>Acacia nigricans</u> (Labill.) R.Br.	sdap
<u>Acacia oxyclada</u> Benth.	AA
<u>Acacia pataczekii</u> D.Morris	<u>K</u>

<u>Acacia peuce</u> F.Muell.	<u>AD</u> , <u>CBG</u> , mel
<u>Acacia phlebophylla</u> Williamson	<u>AD</u>
<u>Acacia pinguifolia</u> J.Black	<u>AD</u>
<u>Acacia plicata</u> Maslin	<u>CBG</u>
<u>Acacia pubescens</u> (Vent.) R.Br.	<u>AD</u> , <u>CBG</u>
<u>Acacia quornensis</u> J.Black	<u>AD</u> , cbg, MEL
<u>Acacia rhetinocarpa</u> J.Black	<u>AD</u> , BRES, <u>CBG</u>
<u>Acacia rhigiophylla</u> Benth.	<u>AD</u> , <u>CBG</u>
<u>Acacia rivalis</u> J.Black	<u>AD</u>
<u>Acacia subracemosa</u> Maslin	<u>CBG</u>
<u>Acacia wattiana</u> Benth.	<u>AD</u> , BR, cbg, mel
<u>Brachysema subcordatum</u> Benth.	<u>CBG</u>
<u>Cassia marksiana</u> (Bailey) Domin	<u>CBG</u>
<u>Chorizema dicksonii</u> Graham	<u>AD</u> , <u>CBG</u>
<u>Daviesia epiphylla</u> Meissner	<u>CBG</u> , <u>KPBG</u>
<u>Daviesia euphorbioides</u> Benth.	<u>CBG</u>
<u>Daviesia mesophylla</u> Ewart	<u>CBG</u>
<u>Daviesia mollis</u> Turcz.	<u>CBG</u>
<u>Daviesia obovata</u> Turcz.	<u>CBG</u>
<u>Daviesia oppositifolia</u> Endl.	<u>CBG</u>
<u>Daviesia pectinata</u> Lindley	<u>AD</u> , <u>KPBG+</u>
<u>Daviesia polyphylla</u> Benth. ex Lindley	<u>CBG</u>
<u>Eutaxia cuneata</u> Meissner	<u>CBG+</u> , mel
<u>Gompholobium burtonioides</u> Meissner	<u>KPBG+</u>
<u>Kennedia becxiana</u> F.Muell.	<u>AD+</u> , <u>CBG</u> , CGG, DBN, <u>KPBG</u> , mel
<u>Kennedia glabrata</u> (Benth.) Lindley	<u>AD+</u> , K, <u>KPBG+</u> , mel

<u>Kennedia macrophylla</u> (Meissner) Benth.	<u>AD</u> , <u>CBG</u> , <u>KPBG+</u> , MEL, MTJB, wsy
<u>Kennedia procurrens</u> Benth.	<u>AD</u>
<u>Kennedia retrorsa</u> Hemsley	<u>AD</u> , <u>CBG+</u> , <u>KPBG</u> , mel, MTJB
<u>Phyllota humifusa</u> Benth.	<u>CBG</u>
<u>Psoralea parva</u> F.Muell.	<u>CBG</u>
<u>Pultenaea aristata</u> DC.	<u>CBG</u>
<u>Pultenaea viscidula</u> Tate	<u>AD</u>
<u>Sophora howinsula</u> (W.Oliver) P.Green	<u>CBG</u> , <u>K</u>
<u>Swainsona laxa</u> R.Br.	cbg+

LILIACEAE

<u>Astelia psychrocharis</u> F.Muell.	<u>CBG</u>
<u>Blandfordia cunninghamii</u> Lindley	<u>CBG</u>
<u>Borya septentrionalis</u> F.Muell.	<u>CBG</u> , mel
<u>Cordyline obtecta</u> Baker	BRES, <u>K</u>
<u>Milligania johnstonii</u> F.Muell.	cbg, <u>E</u>
<u>Milligania longifolia</u> Hook.f.	<u>E</u>
<u>Milligania stylosa</u> F.Muell.	<u>CBG</u> , <u>K</u>
<u>Stypandra grandis</u> C.White	<u>CBG</u>
<u>Thysanotus gracilis</u> R.Br.	UPS

MALVACEAE

<u>Hibiscus insularis</u> Endl.	B, BRES, <u>CBG</u> , K, mel, <u>WAI</u>
<u>Selenothamnus helmsii</u> (F.Muell. & Tate) Melville	<u>CBG</u>

MELIACEAE

<u>Dysoxylum pachyphyllum</u> Hemsley	<u>K</u>
<u>Owenia cepiodora</u> F.Muell.	<u>CBG</u>

MORACEAE

Ficus columnaris C.Moore & F.Meull.

BRES, DBN, K, LECB, ORT+, SDZO+,
WAI

MYOPORACEAE

Eremophila bicolor Chinn.

KPBG+

Eremophila biserrata Chinn.

KPBG

Eremophila parvifolia J.Black

CBG

Eremophila serpens Chinn.

KPBG+

Eremophila virens C.Gardner

KPBG+

Myoporum beckeri Benth.

CBG

MYRSINACEAE

Ardisia bakeri C.White

UPS

MYRTACEAE

Austromyrtus tenuifolia (Smith) Burret

CBG

Backhousia anisata Vick.

CBG, mel

Baeckea denticulata Maiden & E.Betche

CBG

Balaustion microphyllum C.Gardner

KPBG

Callistemon acuminatus Cheel

GBG, k, LE, MEL, TALL

Callistemon formosus S.T.Blake

AD, boch+, BR, CBG+, LE, ORT+

Callistemon polandii Bailey

CBG, mel

Callistemon shiressii Blakely

CBG, ORT+

Callistemon subulatus Cheel

AD, CBG, K, LIVC, mel, WSY

Calothamnus asper Turcz.

AD, CBG, DUSS, KPBG+, LE

Calothamnus blepharanthus F.Muell.

AD

Calothamnus lateralis Lindley

AD, CBG, KPBG+

Calothamnus lehmanii Schauer

AD, KPBG+

Calothamnus longissimus F.Muell.

AD, KPBG+

<u>Calothamnus microcarpus</u> F.Muell.	<u>AD</u>
<u>Calothamnus pachystachyus</u> Benth.	<u>AD</u> , <u>KPBG</u> +
<u>Calothamnus pinifolius</u> F.Muell.	<u>AD</u> , <u>CBG</u> +, <u>K</u> , <u>KPBG</u> +
<u>Calothamnus planifolius</u> Lehm.	<u>AD</u> , <u>CBG</u> , <u>KPBG</u>
<u>Calothamnus robustus</u> Schauer	<u>K</u> , <u>KPBG</u> +
<u>Calothamnus rupestris</u> Schauer	<u>AD</u> +, <u>CBG</u> +, <u>K</u> , <u>KPBG</u> , <u>MB</u> +, <u>MTJB</u> , <u>TUR</u>
<u>Calothamnus validus</u> S.Moore	<u>AD</u> +, <u>BRES</u> +, <u>CBG</u> , <u>K</u> , <u>KPBG</u> +, <u>ORT</u> +, <u>sdap</u> , <u>SDZO</u> +
<u>Calytrix superba</u> C.Gardner & A.S.George	<u>CBG</u>
<u>Corynanthera flava</u> J.Green	<u>CBG</u>
<u>Darwinia carnea</u> C.Gardner	<u>CBG</u> +, <u>KPBG</u>
<u>Darwinia collina</u> C.Gardner	<u>AD</u> +, <u>CBG</u>
<u>Darwinia glaucophylla</u> B.Briggs	<u>AD</u> , <u>CBG</u> +
<u>Darwinia grandiflora</u> (Benth.) R.Baker & H.G.Smith	<u>AD</u>
<u>Darwinia homoranthoides</u> (F.Muell.) J.Black	<u>ad</u>
<u>Darwinia leiostyla</u> (Turcz.) Domin	<u>AD</u> +
<u>Darwinia macrostegia</u> (Turcz.) Benth.	<u>KPBG</u>
<u>Darwinia meeboldii</u> C.Gardner	<u>MEL</u>
<u>Darwinia procera</u> B.Briggs	<u>AD</u> , <u>CBG</u> +
<u>Darwinia rhadinophylla</u> F.Muell.	<u>AD</u> , <u>KPBG</u>
<u>Eremaea acutifolia</u> F.Muell.	<u>AD</u> , <u>KPBG</u>
<u>Eucalyptus acaciiformis</u> Deane & Maiden	<u>BATU</u> +, <u>cbg</u> , <u>K</u> , <u>LE</u> , <u>MEL</u>
<u>Eucalyptus alpina</u> Lindley	<u>AD</u> , <u>CBG</u> , <u>DUSS</u> , <u>FRP</u> , <u>LE</u> , <u>LIVC</u> , <u>MTJB</u>
<u>Eucalyptus angustissima</u> F.Muell.	<u>AA</u> , <u>CBG</u> , <u>KPBG</u> +
<u>Eucalyptus apiculata</u> R.Baker & H.G.Smith	<u>CBG</u> , <u>FRP</u>

<u>Eucalyptus approximans</u> Maiden	<u>BR</u> , <u>CBG</u>
<u>Eucalyptus argophloia</u> Blakely	cbg
<u>Eucalyptus badjensis</u> Beuzev. & Welch	<u>CBG</u>
<u>Eucalyptus baeuerlenii</u> F.Muell.	<u>CBG</u>
<u>Eucalyptus barberi</u> L.Johnson & Blaxell	<u>CBG</u> , <u>K</u>
<u>Eucalyptus benthamii</u> Maiden & Cambage	<u>CBG</u>
<u>Eucalyptus brachyphylla</u> C.Gardner	<u>KPBG</u>
<u>Eucalyptus brevistylis</u> Brooker	<u>CBG</u>
<u>Eucalyptus brockwayi</u> C.Gardner	<u>AD</u> , <u>CBG</u> , <u>KPBG</u>
<u>Eucalyptus burdettiana</u> Blakely & Steedman	<u>AD</u> , <u>K</u> , <u>KPBG</u> , <u>LE</u> , <u>MTJB</u> , <u>sdap</u> , <u>SDZO+</u>
<u>Eucalyptus burgessiana</u> L.Johnson & Blaxell	<u>CBG</u> , <u>LE</u>
<u>Eucalyptus caesia</u> Benth.	<u>AD</u> , <u>CBG</u> , <u>K</u> , <u>KPBG+</u> , <u>LE</u> , <u>mel</u> , <u>sdap</u> , <u>SDZO+</u>
<u>Eucalyptus calcicola</u> Brooker	<u>CBG</u> , <u>KPBG</u>
<u>Eucalyptus camfieldii</u> Maiden	<u>CBG</u>
<u>Eucalyptus carnabyi</u> Blakely & Steedman	<u>KPBG</u>
<u>Eucalyptus chapmaniana</u> Cameron	<u>CBG</u>
<u>Eucalyptus cneorifolia</u> DC.	<u>AD+</u> , cbg, <u>MEL</u>
<u>Eucalyptus codonocarpa</u> Blakely & McKie	<u>CBG</u>
<u>Eucalyptus cordata</u> Labill.	<u>AD</u> , <u>BATU</u> , <u>CBG</u> , <u>LIVC</u> , <u>mel</u> , <u>PALZ</u> , <u>SDZO+</u>
<u>Eucalyptus cornuta</u> Labill.	<u>AD+</u> , <u>CBG</u> , <u>K</u> , <u>KAUN</u> , <u>KPBG+</u> , <u>LE</u> , <u>SDZO+</u>
<u>Eucalyptus coronata</u> C.Gardner	<u>K</u> , <u>KPBG</u>
<u>Eucalyptus corrugata</u> Luehm.	<u>KPBG</u>
<u>Eucalyptus crenulata</u> Blakely & Beuzev.	<u>BRES</u> , <u>CBG</u> , <u>DBN</u> , <u>mel</u> , <u>SDZO+</u>
<u>Eucalyptus crucis</u> Maiden	<u>CBG</u> , <u>KPBG</u>

<u>Eucalyptus curtisii</u> Blakely & C.White	cbg, DBN, <u>K</u> , LE
<u>Eucalyptus desmondensis</u> Maiden & Blakely	AD, <u>CBG</u> , <u>K</u> , <u>KPBG</u>
<u>Eucalyptus dunnii</u> Maiden	<u>AD</u> , <u>CBG</u>
<u>Eucalyptus effusa</u> Brooker	<u>CBG</u>
<u>Eucalyptus ficifolia</u> F.Muell.	AD, B, <u>BR</u> , <u>CBG</u> , DBN, <u>E</u> , FRP, <u>K</u> , <u>KPBG+</u> , LE, <u>MB</u> , mel, ort+, sdap, sdzo+, TALL, UPS
<u>Eucalyptus formanii</u> C.Gardner	AD+, <u>CBG</u> , <u>KPBG+</u>
<u>Eucalyptus forrestiana</u> Diels	AD, BR, <u>KPBG+</u> , sdap, sdzo+
<u>Eucalyptus fraseri</u> (Brooker) Brooker	ad, <u>CBG</u>
<u>Eucalyptus froggattii</u> Blakely	<u>CBG</u> , DBN
<u>Eucalyptus gardneri</u> Maiden	AD, <u>CBG</u> , <u>KPBG+</u> , mel
<u>Eucalyptus gittinsii</u> Brooker & Blaxell	<u>CBG</u>
<u>Eucalyptus gregsoniana</u> L.Johnson & Blaxell	<u>CBG</u>
<u>Eucalyptus guilfoylei</u> Maiden	AD, BRES, <u>KPBG</u>
<u>Eucalyptus imlayensis</u> Crisp & Brooker	<u>CBG</u>
<u>Eucalyptus jacksonii</u> Maiden	<u>AD+</u> , <u>K</u>
<u>Eucalyptus johnsoniana</u> Brooker & Blaxell	AD
<u>Eucalyptus jutsonii</u> Maiden	AD, <u>KPBG+</u>
<u>Eucalyptus kartzoffiana</u> L.Johnson & Blaxell	<u>CBG</u>
<u>Eucalyptus kitsoniana</u> Maiden	BGAAS, <u>CBG</u> , sdap, sdzo+
<u>Eucalyptus kruseana</u> F.Muell.	AD, <u>CBG</u> , <u>K</u> , <u>KPBG+</u> , <u>LE</u> , <u>MB</u> , MEL, <u>TUR</u>
<u>Eucalyptus kybeanensis</u> Maiden & Cambage	<u>CBG</u>
<u>Eucalyptus laeliae</u> Podger & Chippendale	ad, <u>CBG</u>

<u>Eucalyptus lansdowneana</u> J.Brown	ad, KPBG, sdzo+
<u>Eucalyptus ligulata</u> Brooker	<u>CBG</u>
<u>Eucalyptus luehmanniana</u> F.Muell.	<u>CBG</u>
<u>Eucalyptus macarthurii</u> Deane & Maiden	<u>AD</u> , BATU+, BGAAS, cbg, DBN, LE, mel, palz, sdzo+, <u>TCD</u>
<u>Eucalyptus macrandra</u> Benth.	<u>AD</u> , <u>CBG</u>
<u>Eucalyptus megacornuta</u> C.Gardner	AD+, <u>CBG</u> , DBN, mel, SDZO+
<u>Eucalyptus merrickiae</u> Maiden & Blakely	le
<u>Eucalyptus michaeliana</u> Blakely	<u>CBG</u> , LE
<u>Eucalyptus mitchelliana</u> Cambage	BRES, le, WTU
<u>Eucalyptus mooreana</u> (W.Fitzg.) Maiden	BATU+
<u>Eucalyptus morrisbyi</u> Brett	<u>CBG</u>
<u>Eucalyptus neglecta</u> Maiden	<u>CBG</u> , e, <u>K</u> , PALZ, tim
<u>Eucalyptus nicholii</u> Maiden & Blakely	AD, cbg, DBN, mel, sdap, <u>WTU</u>
<u>Eucalyptus nutans</u> F.Muell.	AD, <u>CBG</u> , <u>K</u> , <u>KPBG</u> +, MEL
<u>Eucalyptus olsenii</u> L.Johnson & Blaxell	<u>CBG</u> +
<u>Eucalyptus orbifolia</u> F.Muell.	<u>AD</u> , <u>CBG</u> , <u>KPBG</u> , MEL
<u>Eucalyptus ovularis</u> Maiden & Blakely	AD, <u>CBG</u>
<u>Eucalyptus pachycalyx</u> Maiden & Blakely	<u>CBG</u>
<u>Eucalyptus paliformis</u> L.Johnson & Blaxell	<u>CBG</u>
<u>Eucalyptus parvifolia</u> Cambage	<u>CBG</u> , CGG, FRP, <u>K</u> , <u>LE</u> , MTJB, ubc, WTU
<u>Eucalyptus pendens</u> Brooker	<u>KPBG</u>
<u>Eucalyptus pimpiniana</u> Maiden	ad
<u>Eucalyptus pulverulenta</u> Sims	AD, <u>CBG</u> , sdap, sdzo+, <u>TCD</u>
<u>Eucalyptus pumila</u> Cambage	<u>CBG</u> , MEL
<u>Eucalyptus remota</u> Blakely	<u>CBG</u>

<u>Eucalyptus rhodantha</u> Blakely & Steedman	ad, FRP, <u>KPBG</u> , MEL, sdap
<u>Eucalyptus risdonii</u> Hook.f.	ad, BRES, DBN, <u>K</u> , mel
<u>Eucalyptus rupicola</u> L.Johnson & Blaxell	AD, <u>CBG</u>
<u>Eucalyptus saxatilis</u> Kirkpatr. & Brooker	<u>CBG</u>
<u>Eucalyptus scoparia</u> Maiden	AD, BATU+, cbg, tim
<u>Eucalyptus sepulcralis</u> F.Muell.	AD, <u>KPBG</u> +, mel
<u>Eucalyptus squamosa</u> Deane & Maiden	mel
<u>Eucalyptus steedmanii</u> C.Gardner	ad, <u>CBG</u> , KPBG, sdzo+
<u>Eucalyptus stoatei</u> C.Gardner	<u>CBG</u> +, <u>KPBG</u>
<u>Eucalyptus sturgissiana</u> L.Johnson & Blaxell	<u>CBG</u>
<u>Eucalyptus tetrapleura</u> L.Johnson	<u>CBG</u>
<u>Eucalyptus triflora</u> (Maiden) Blakely	<u>CBG</u>
<u>Eucalyptus woodwardii</u> Maiden	ad, <u>K</u> , <u>KPBG</u> +, sdzo+
<u>Eucalyptus xanthonema</u> Turcz.	AA, AD, <u>KPBG</u> , mel
<u>Eucalyptus yarraensis</u> Maiden & Cambage	AD, <u>CBG</u>
<u>Homoranthus darwinioides</u> (Maiden & E.Betche) Cheel	<u>CBG</u>
<u>Homoranthus pappilatus</u> Byrnes	<u>CBG</u> +
<u>Kunzea baxteri</u> Schauer	AD+, <u>CBG</u> +, E, <u>KPBG</u> +, <u>LIVC</u> , <u>MB</u> , MEL, OULU, sdap
<u>Kunzea bracteolata</u> Maiden & E.Betche	<u>CBG</u> +
<u>Kunzea cambagei</u> Maiden & E.Betche	<u>CBG</u>
<u>Kunzea flavescens</u> C.White & Francis	<u>CBG</u> +, <u>LE</u>
<u>Kunzea pauciflora</u> Schauer	<u>CBG</u> +, <u>KPBG</u> +
<u>Leptospermum epacridoideum</u> Cheel	AD+, <u>CBG</u> +, DBN, <u>LIVC</u>

<u>Leptospermum grandiflorum</u> Lodd.	DBN, <u>K</u> , PALZ
<u>Leptospermum luehmannii</u> Bailey	<u>CBG</u> +
<u>Leptospermum sericeum</u> Labill.	AD, <u>CBG</u> , <u>E</u> , <u>K</u> , <u>KPBG</u> +, livc+, MEL
<u>Leptospermum whitei</u> Cheel	cbg
<u>Leptospermum wooroonooran</u> Bailey	<u>CBG</u> +
<u>Melaleuca citrina</u> Turcz.	AD+, <u>CBG</u> , <u>K</u> , UPS
<u>Melaleuca coccinea</u> A.S.George	AD+, <u>K</u> , <u>KPBG</u> +
<u>Melaleuca corrugata</u> Eardley	ad
<u>Melaleuca graminea</u> S.Moore	AD+
<u>Melaleuca groveana</u> Cheel & White	cbg+
<u>Melaleuca nesophila</u> F.Muell.	AD+, B, BR, <u>CBG</u> +, DBN, K, <u>KPBG</u> +, LE, MEL, sdzo+
<u>Melaleuca pustulata</u> Hook.f.	MTJB
<u>Melaleuca steedmanii</u> Gardner	AD+, <u>CBG</u> +, DBN, MEL
<u>Metrosideros nervulosa</u> C.Moore & F.Muell.	<u>CBG</u> , <u>K</u>
<u>Regelia cymbifolia</u> (Schauer) C.Gardner	<u>KPBG</u> +
<u>Regelia velutina</u> (Turcz.) C.Gardner	AD+, cbg, <u>K</u> , <u>KPBG</u> +
<u>Syncarpia hillii</u> Bailey	cbg
<u>Syzygium moorei</u> (F.Muell.) L.Johnson	mel
<u>Thryptomene stenophylla</u> E.Pritzel	cbg
<u>Uromyrtus australis</u> A.J.Scott	<u>CBG</u> +
<u>Verticordia grandis</u> Drumm.	<u>CBG</u> , <u>KPBG</u>
<u>Verticordia lindleyi</u> Schauer	<u>KPBG</u>
<u>Verticordia staminosa</u> Gardner & A.S.George	<u>KPBG</u> +

NYMPHAEACEAE

<u>Ondinea purpurea</u> Hartog	<u>KPBG</u>
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ORCHIDACEAE

<u>Anoectochilus yatesae</u> Bailey	<u>CBG</u>
<u>Bulbophyllum globuliforme</u> Nicholls	<u>CBG</u>
<u>Bulbophyllum lageniforme</u> Bailey	<u>CBG</u>
<u>Bulbophyllum nematopodum</u> F.Muell.	<u>CBG</u> , mel
<u>Cadetia collinsii</u> Lavarack	<u>CBG</u>
<u>Caladenia crebra</u> A.S.George	<u>CBG</u>
<u>Caladenia cristata</u> R.Rogers	<u>CBG</u>
<u>Caladenia drummondii</u> Benth.	<u>CBG</u>
<u>Caladenia gladiolata</u> R.Rogers	<u>CBG</u>
<u>Caladenia integra</u> E.Coleman	<u>CBG</u> +
<u>Caladenia leptochila</u> Fitzg.	cbg+
<u>Caladenia patersonii</u> R.Br. var. <u>hastata</u> Nicholls	<u>CBG</u>
<u>Caladenia radialis</u> R.Rogers	<u>CBG</u>
<u>Caladenia rigida</u> R.Rogers	<u>CBG</u>
<u>Corybas abellianus</u> Dockr.	<u>CBG</u>
<u>Dendrobium bairdianum</u> Bailey	<u>AD</u> , <u>CBG</u> , <u>K</u>
<u>Dendrobium bigibbum</u> Lindley & Paxton	<u>AD</u> , <u>b</u> , <u>CBG</u> , <u>FRP</u> , <u>GBG</u> , <u>K</u> , <u>LIVC</u> , <u>MEL</u> , <u>sdzo</u> +
<u>Dendrobium brachypus</u> (Endl.) Reichb.	<u>CBG</u>
<u>Dendrobium carriei</u> Rupp & C.White	<u>CBG</u> , <u>MEL</u>
<u>Dendrobium falcorostrum</u> Fitzg.	<u>CBG</u> , <u>E</u> , <u>gbg</u> , <u>K</u> , <u>KPBG</u> , <u>SDZO</u> +
<u>Dendrobium fleckeri</u> Rupp & C.White	ad, <u>CBG</u> , <u>K</u> , <u>MEL</u>
<u>Dendrobium johannis</u> Reichb.f.	<u>AD</u> , <u>CBG</u> , <u>K</u> , <u>MEL</u>
<u>Dendrobium macropus</u> (Endl.) C.Moore	<u>E</u> , <u>K</u>
<u>Dendrobium malbournii</u> Dockr.	<u>AD</u> , <u>CBG</u> , mel

<u>Dendrobium moorei</u> F.Muell.	<u>CBG</u> , <u>K</u> , MEL
<u>Dendrobium racemosum</u> (Nicholls) Clemesha & Dockr.	<u>CBG</u> , FRP, MEL
<u>Dendrobium schneiderae</u> Bailey	<u>CBG</u> , <u>K</u> , MEL
<u>Dendrobium tenuissimum</u> Rupp	<u>CBG</u> , <u>E</u> , mel
<u>Dendrobium tozerensis</u> Lavarack	<u>AD</u> , <u>CBG</u> +
<u>Dendrobium wassellii</u> S.T.Blake	<u>AD</u> , <u>CBG</u> , FRP, <u>K</u> , mel
<u>Dendrobium wilkianum</u> Rupp	<u>AD</u> , <u>CBG</u> , FRP, mel
<u>Diplocaulobium masonii</u> (Rupp) Dockr.	<u>AD</u> , cbg
<u>Diuris aequalis</u> Reichb.f.	<u>CBG</u>
<u>Diuris pallens</u> Benth.	<u>CBG</u>
<u>Diuris purdiei</u> Diels	<u>CBG</u>
<u>Diuris sheaffiana</u> Fitzg.	<u>CBG</u>
<u>Drymoanthus minutus</u> Nicholls	<u>CBG</u>
<u>Epiblema grandiflorum</u> R.Br.	<u>CBG</u>
<u>Eria irukandjiana</u> St. Cloud	<u>CBG</u>
<u>Genoplesium baueri</u> R.Br.	<u>CBG</u>
<u>Habenaria hymenophylla</u> Schltr.	<u>CBG</u>
<u>Lyperanthus forrestii</u> F.Muell.	<u>CBG</u>
<u>Malaxis fimbriata</u> Lavarack	<u>CBG</u>
<u>Mobilabium hamatum</u> Rupp	<u>CBG</u> , MEL
<u>Oberonia carnosa</u> Lavarack	<u>CBG</u> , mel
<u>Papillilabium beckleri</u> (Benth.) Dockr.	<u>CBG</u>
<u>Peristylus banfieldii</u> (Bailey) Lavarack	<u>CBG</u>
<u>Phaius australis</u> F.Muell.	<u>CBG</u> , K
<u>Prasophyllum drummondii</u> Reichb.f.	<u>CBG</u>

<u>Pteroceras hirticalcar</u> (Dockr.) Garay	<u>CBG</u>
<u>Pterostylis angusta</u> A.S.George	<u>CBG</u>
<u>Pterostylis cucullata</u> R.Br.	AD, <u>CBG</u> , K
<u>Pterostylis depauperata</u> Bailey	<u>CBG</u>
<u>Pterostylis gibbosa</u> R.Br.	<u>CBG</u> +
<u>Pterostylis longicurva</u> Rupp	<u>CBG</u>
<u>Pterostylis pulchella</u> Messmer	<u>CBG</u> +
<u>Pterostylis woollsii</u> Fitzg.	<u>CBG</u>
<u>Saccolabiopsis armitii</u> (F.Muell.) Dockr.	<u>CBG</u>
<u>Sarcochilus brevirhachis</u> Upton	<u>CBG</u>
<u>Sarcochilus dilatatus</u> F.Muell.	<u>CBG</u> , FRP, MEL
<u>Sarcochilus fitzgeraldii</u> F.Muell.	BR, <u>CBG</u> , E, FRP, <u>K</u> , mel
<u>Sarcochilus hartmannii</u> F.Muell.	AD, <u>CBG</u> +, <u>E</u> , K, MEL
<u>Sarcochilus weinthalii</u> Bailey	<u>CBG</u>
<u>Schistostylis purpuratus</u> (Rupp) Dockr.	<u>CBG</u>
<u>Thelymitra campanulata</u> Lindley	<u>CBG</u>
<u>Thelymitra epipactoides</u> F.Muell.	<u>CBG</u>
<u>Thelymitra matthewsii</u> Cheeseman	<u>CBG</u>
<u>Thelymitra psammophila</u> C.R.P.Andrews	<u>CBG</u>
<u>Thelymitra spiralis</u> (Lindley) F.Muell.	<u>CBG</u> , <u>KPBG</u>
<u>Thelymitra tigrina</u> R.Br.	<u>CBG</u>
<u>Trachoma subluteum</u> (Rupp) Garay	AD, cbg, mel
<u>Trichoglottis australiensis</u> Dockr.	<u>CBG</u> , MEL
<u>Vanda hindsii</u> Lindley	AD, <u>CBG</u> , E, <u>K</u> , MEL

PALMAE

<u>Arenga australasica</u> (H.A.Wendl. & Drude) S.T.Blake	AA, SDZO, <u>WAI</u>
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<u>Carpentaria acuminata</u> Becc.	K, SDZO
<u>Gronophyllum ramsayi</u> (Becc.) H.Moore	<u>SDZO</u>
<u>Gulubia costata</u> Becc.	e
<u>Hedyscepe canterburyana</u> (C.Moore & F.Muell.) H.Wendl.	BR, FRP, <u>K</u> , LE, mel, ORT, sdap, sdzo
<u>Howea belmoreana</u> (C.Moore & F.Muell.) Becc.	b, BATU+, BOCH, BR, DBN, DELF, DUSS, E, FRP, gbg, K, LE, mb, mel, MTJB, mw, ort+, RIG, sdap, SDZO, u, <u>WAI</u>
<u>Howea forsteriana</u> (C.Moore & F.Muell.) Becc.	AA, b, BATU+, bern, BLAN, BOCH, BR, dbn, e, FRP, gbg, <u>K</u> , KAUN, KAZZ, KUIB, LE, LECB, lisjc+, mb, mel, MHA, mil, MSK, mw, <u>ORT+</u> , OULU, RIG, RIGA, sdap, teg, TUR, u, UPS, wa, <u>WAI</u>
<u>Lepidorrhachis mooreana</u> (F.Muell.) Cook	FRP
<u>Livistona alfredii</u> F.Muell.	<u>AD</u> , <u>KPBG</u> , SDZO
<u>Livistona drudei</u> F.Muell.	SDZO, <u>WAI</u>
<u>Livistona eastonii</u> C.Gardner	<u>AD</u> , <u>KPBG</u>
<u>Livistona loriphylla</u> Becc.	<u>KPBG</u> , SDZO
<u>Livistona mariae</u> F.Muell.	<u>AD</u> , <u>FRP</u> , LE, mel, mil, MTJB, SDZO, wai
<u>Normanbya normanbyi</u> (W.Hill) L.Bailey	AD, SDZO
<u>Orania appendiculata</u> (Bailey) Domin	MB
<u>Rhopalostylis baueri</u> (Hook.f.) H.A.Wendl & Drude	<u>E</u> , FRP, K, KAZZ, LE, MHA, MW+, palz, SDZO
PANDANACEAE	
<u>Freycinetia australiensis</u> Warb.	MHA
<u>Freycinetia baueriana</u> Endl. subsp. <u>baueriana</u>	AD
<u>Pandanus basedowii</u> C.H.Wright	<u>CBG</u>
<u>Pandanus forsteri</u> C.Moore & F.Muell.	AA, <u>K</u> , <u>KPBG</u> , mel
<u>Pandanus gemmiferus</u> St. John	<u>CBG</u>

PHILYDRACEAE

<u>Helmholtzia glaberrima</u> (Hook.f.) Caruel	<u>CBG</u>
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PITTOSPORACEAE

<u>Citriobatus lancifolius</u> Bailey	<u>AD</u> , mel
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<u>Pittosporum bracteolatum</u> Endl.	<u>K</u>
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<u>Pittosporum erioloma</u> C.Moore & F.Muell.	AD, e, <u>K</u> , mel, MHA
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<u>Pittosporum oreillyanum</u> C.White	<u>CBG</u>
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PLANTAGINACEAE

<u>Plantago palustris</u> Fraser & Vick.	<u>CBG</u>
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PORTULACACEAE

<u>Calandrinia volubilis</u> Benth.	UPS
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PROTEACEAE

<u>Adenanthos cunninghamii</u> Meissner	<u>CBG</u>
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<u>Adenanthos ellipticus</u> A.S.George	<u>CBG</u>
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<u>Adenanthos forrestii</u> F.Muell.	<u>CBG</u>
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<u>Adenanthos ileticos</u> Nelson	<u>CBG</u>
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<u>Adenanthos pungens</u> Meissner	AD, <u>KPBG</u>
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<u>Adenanthos velutina</u> Meissner	<u>CBG</u>
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<u>Adenanthos venosus</u> Meissner	<u>CBG</u>
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<u>Banksia blechnifolia</u> F.Muell.	AD
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<u>Banksia brownii</u> R.Br.	AD, BATU+, <u>CBG</u> , <u>KPBG</u>
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<u>Banksia burdettii</u> Bakh.f.	AD+, <u>CBG</u> +, <u>MB</u> , sdap
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<u>Banksia elegans</u> Meissner	AD
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<u>Banksia goodii</u> R.Br.	AD, MEL
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<u>Banksia hookeriana</u> Meissner	AD, cbg+, <u>K</u> , <u>KPBG</u> +, MEL
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<u>Banksia laricina</u> C.Gardner	AD, BATU, <u>KPBG</u> , MEL, <u>ORT</u> +, tcd
<u>Banksia lullfitzli</u> C.Gardner	AD, MEL
<u>Banksia pilostylis</u> C.Gardner	AD+, cbg+, <u>E</u> , <u>KPBG</u> +, <u>LIVC</u> , MEL, <u>ORT</u> +
<u>Banksia praemorsa</u> C.R.P.Andrews	AD+, <u>CBG</u> , <u>KPBG</u> +, LE, MEL, MHA, sdap
<u>Banksia solandri</u> R.Br.	AD, <u>CBG</u> , <u>KPBG</u> , MEL
<u>Banksia tricuspid</u> Meissner	AD, <u>KPBG</u> , MEL
<u>Banksia verticillata</u> R.Br.	AD, <u>CBG</u> , <u>KPBG</u> , MEL
<u>Dryandra arborea</u> C.Gardner	<u>KPBG</u> , MHA
<u>Dryandra calophylla</u> R.Br.	<u>CBG</u> , <u>KPBG</u> , MEL
<u>Dryandra longifolia</u> R.Br.	MEL
<u>Dryandra nana</u> Meissner	MEL
<u>Dryandra polycephala</u> Benth.	AD, K, <u>KPBG</u> , MEL
<u>Dryandra praemorsa</u> Meissner	AD, <u>CBG</u> , <u>DUSS</u> , <u>KPBG</u> , LE, MB, MEL, MHA
<u>Dryandra proteoides</u> Lindley	AD, <u>MB</u> , MEL, MHA
<u>Dryandra pteridifolia</u> R.Br.	AD, <u>CBG</u> , <u>KPBG</u> +, MEL
<u>Dryandra quercifolia</u> Meissner	AD, <u>CBG</u> , <u>DUSS</u> , <u>KPBG</u> , MEL
<u>Dryandra squarrosa</u> R.Br.	AD
<u>Dryandra tridentata</u> Meissner	<u>CBG</u> , MEL
<u>Grevillea annulifera</u> F.Muell.	<u>KPBG</u> +
<u>Grevillea barklyana</u> Benth.	ad, <u>CBG</u> +, mel
<u>Grevillea brachystachya</u> Meissner	MEL
<u>Grevillea brachystylis</u> Meissner	<u>KPBG</u>
<u>Grevillea caleyi</u> R.Br.	<u>CBG</u> +, MHA
<u>Grevillea candelabroides</u> C.Gardner	AD, <u>KPBG</u> +
<u>Grevillea candolleana</u> Meissner	BATU+

<u>Grevillea capitellata</u> Meissner	ad, <u>CBG</u> , mel
<u>Grevillea confertifolia</u> F.Muell.	ad+, <u>CBG</u> +, mel
<u>Grevillea costata</u> A.S.George	BATU+, <u>KPBG</u>
<u>Grevillea diminuta</u> L.Johnson	AD, <u>CBG</u> +, MEL
<u>Grevillea dryandroides</u> C.Gardner	ad, <u>CBG</u> , MHA
<u>Grevillea evansiana</u> McKee	<u>CBG</u> +
<u>Grevillea flexuosa</u> (Lindley) Meissner	ad, <u>KPBG</u>
<u>Grevillea halmaturina</u> Tate	cbg
<u>Grevillea jephcottii</u> J.H.Willis	<u>CBG</u> +, mel
<u>Grevillea kennedyana</u> F.Muell.	<u>CBG</u>
<u>Grevillea microstegia</u> Molyneux	BATU+, <u>CBG</u> +, MEL
<u>Grevillea obtusiflora</u> R.Br.	AD, mel
<u>Grevillea prostrata</u> Gardner & A.S.George	ad
<u>Grevillea renwickiana</u> F.Muell.	<u>CBG</u> +
<u>Grevillea repens</u> Meissner	AD, mel
<u>Grevillea ripicola</u> A.S.George	BATU+
<u>Grevillea rivularis</u> L.Johnson & McGillivray	<u>CBG</u> +, MEL
<u>Grevillea rogersii</u> Maiden	ad+, cbg+
<u>Grevillea scortechinii</u> (Bailey) F.Muell.	BATU+
<u>Grevillea shiressii</u> Blakely	AD+, <u>CBG</u> +, MEL
<u>Grevillea steiglitziana</u> Wakef.	<u>CBG</u>
<u>Grevillea thyrsoides</u> Meissner	<u>CBG</u>
<u>Grevillea trachytheca</u> F.Muell.	<u>KPBG</u>
<u>Grevillea umbellifera</u> J.Black	<u>CBG</u>
<u>Grevillea variifolia</u> Gardner & A.S.George	<u>KPBG</u>

<u>Grevillea willisii</u> R.V.Smith & McGillivray	AD, cbg+, mel
<u>Hakea aculeata</u> A.S.George	FRP
<u>Hakea baxteri</u> R.Br.	AD, <u>CBG+</u> , <u>KPBG+</u> , mel
<u>Hakea constablei</u> L.Johnson	<u>CBG+</u>
<u>Hakea cristata</u> R.Br.	AD, dbn, K, <u>KPBG</u> , <u>LIVC</u> , mel, MHA
<u>Hakea grammatophylla</u> (F.Muell.) F.Muell.	BR, CBG
<u>Hakea hookeriana</u> Meissner	<u>CBG</u> , <u>KPBG</u>
<u>Hakea macraeana</u> F.Muell.	<u>CBG+</u> , mel, ORT+
<u>Hakea megalosperma</u> Meissner	FRP, <u>KPBG+</u>
<u>Hakea myrtoides</u> Meissner	AD, <u>CBG</u> , <u>KPBG+</u>
<u>Hakea neurophylla</u> Meissner	<u>KPBG+</u>
<u>Hakea obtusa</u> Meissner	AD+, <u>CBG</u> , <u>KPBG+</u> , MHA
<u>Hakea victoria</u> Drumm.	AD+, <u>CBG</u> , <u>K</u> , <u>KPBG+</u> , MEL, ORT+
<u>Isopogon axillaris</u> R.Br.	<u>KPBG</u>
<u>Isopogon baxteri</u> R.Br.	AD+
<u>Isopogon cuneatus</u> R.Br.	AD, B, <u>CBG</u> , <u>CGG</u> , DBN, <u>KPBG</u> , MHA
<u>Isopogon latifolius</u> R.Br.	AD+, <u>KPBG+</u>
<u>Isopogon prostratus</u> McGillivray	<u>CBG+</u>
<u>Isopogon tridens</u> F.Muell.	<u>KPBG</u> , MEL, MHA
<u>Lambertia echinata</u> R.Br.	AD
<u>Lomatia tasmanica</u> W.M.Curtis	K
<u>Oreocallis pinnata</u> (Maiden & E.Betche) Sleumer	ad
<u>Persoonia articulata</u> R.Br.	<u>CBG</u>
<u>Petrophila biloba</u> R.Br.	ad+, <u>CBG+</u> , <u>KPBG</u>
<u>Petrophila carduacea</u> Meissner	<u>KPBG</u>

<u>Strangea cynanchicarpa</u> (Meissner) F.Muell.	<u>CBG</u>
<u>Strangea linearis</u> Meissner	<u>CBG</u>
<u>Telopea mongaensis</u> Cheel	AD, <u>CBG+</u> , CGG, K, <u>MB</u>
RANUNCULACEAE	
<u>Anemone crassifolia</u> Hook.	BATU+, <u>CBG+</u> , <u>K</u>
<u>Ranunculus anemoneus</u> F.Muell.	<u>CBG</u> , <u>K</u>
<u>Ranunculus concinnus</u> (Hook.f.) Melville	<u>K</u>
<u>Ranunculus niphophilus</u> B.Briggs	<u>CBG</u> , <u>K</u>
RHAMNACEAE	
<u>Cryptandra polyclada</u> Diels	<u>CBG</u>
<u>Pomaderris pauciflora</u> Wakef.	<u>CBG</u>
<u>Siegfriedia darwinoides</u> C.Gardner	<u>KPBG</u>
<u>Spyridium coactilifolium</u> Reisseck	ad
<u>Spyridium spathulatum</u> (F.Muell.) Benth.	<u>CBG</u>
ROSACEAE	
<u>Geum talbotianum</u> W.M.Curtis	<u>E</u> , <u>K</u>
RUBIACEAE	
<u>Coprosma baueri</u> Endl.	BATU+, br, DUSS, k, KPABG, MTJB, MW+, OULU, sdzo, TALL, TUR, u
<u>Coprosma moorei</u> Rodway	<u>K</u>
<u>Coprosma prisca</u> W.Oliver	<u>CBG</u>
<u>Randia stipulosa</u> C.Moore & F.Muell.	<u>K</u>
RUTACEAE	
<u>Acradenia franklinii</u> Kipp.	BRES, <u>CBG+</u> , DUSS, E, k, PALZ
<u>Asterolasia hexapetala</u> (Juss.f.) Druce	<u>CBG+</u>

<u>Boronia clavata</u> P.G.Wilson	AD+, cbg+, MEL
<u>Boronia deanei</u> Maiden & E.Betche	AD+, <u>CBG</u> +
<u>Boronia edwardsii</u> Benth.	<u>CBG</u>
<u>Boronia filifolia</u> F.Muell.	cbg
<u>Boronia keysii</u> Domin	<u>CBG</u>
<u>Boronia latipinna</u> J.H.Willis	<u>CBG</u> +, MEL
<u>Boronia pulchella</u> Turcz.	<u>CBG</u> +
<u>Boronia rivularis</u> C.White	<u>CBG</u> +
<u>Boronia subulifolia</u> Cheel	<u>CBG</u> +
<u>Correa baeuerlenii</u> F.Muell.	AD+, <u>CBG</u> +, mel
<u>Correa calycina</u> J.Black	<u>AD</u> +, <u>CBG</u> +
<u>Correa decumbens</u> F.Muell.	AD+, <u>CBG</u> +, K, LIVC, MEL
<u>Eriostemon ericifolius</u> Benth.	<u>CBG</u> +
<u>Geleznovia verrucosa</u> Turcz.	AD
<u>Microcitrus australasica</u> (F.Muell.) Swingle	<u>CBG</u> +, E, mel
<u>Microcitrus garrowayi</u> Swingle	<u>CBG</u>
<u>Phebalium carruthersii</u> (F.Muell.) Maiden & E.Betche	<u>CBG</u>
<u>Phebalium coxii</u> (F.Muell.) Maiden & E.Betche	<u>CBG</u> +
<u>Phebalium ellipticum</u> P.G.Wilson	<u>CBG</u>
<u>Phebalium gracile</u> C.White	<u>CBG</u> +
<u>Phebalium montanum</u> Hook.	<u>K</u>
<u>Phebalium ovatifolium</u> F.Muell.	<u>CBG</u> +
<u>Phebalium ralstonii</u> (F.Muell.) Benth.	<u>CBG</u> +
<u>Phebalium viridiflorum</u> P.G.Wilson	<u>CBG</u>
<u>Zieria involucrata</u> Benth.	<u>CBG</u>

SAPINDACEAE

<u>Arytera microphylla</u> (Benth.) Radlk.	<u>CBG+</u>
<u>Dodonaea hackettiana</u> W.Fitzg.	<u>KPBG+</u>
<u>Dodonaea hirsuta</u> Maiden & E.Betche	<u>CBG</u>
<u>Dodonaea rhombifolia</u> Wakef.	<u>CBG+</u>
<u>Dodonaea rupicola</u> C.White	<u>CBG+</u>
<u>Dodonaea trifida</u> F.Muell.	<u>CBG+</u>

SAPOTACEAE

<u>Planchonella eerwah</u> (Bailey) P.Royen	<u>CBG, MEL</u>
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SOLANACEAE

<u>Anthocercis angustifolia</u> F.Muell.	<u>AD</u>
<u>Anthocercis anisantha</u> Endl.	<u>AD</u>
<u>Anthocercis aromatica</u> C.Gardner	<u>AD</u>
<u>Anthocercis frondosa</u> (Miers) J.Black	<u>AD, CBG</u>
<u>Anthocercis intricata</u> F.Muell.	<u>AD, KPBG</u>
<u>Anthocercis odgersii</u> F.Muell.	<u>CBG</u>
<u>Anthocercis scabrella</u> Benth.	<u>CBG</u>
<u>Anthocercis tasmanica</u> Hook.f.	<u>AD, K</u>
<u>Solanum asymetripHYllum</u> Specht	<u>CBG</u>

STERCULIACEAE

<u>Rulingia hermannifolia</u> (DC.) Steetz	<u>CBG+</u>
<u>Thomasia discolor</u> Steudel	<u>KPBG</u>
<u>Thomasia solanacea</u> (Sims) Gay	<u>ad, cbg+, k</u>

STYLIDIACEAE

<u>Forstera bellidifolia</u> Hook.	<u>K</u>
<u>Stylidium galioides</u> C.Gardner	<u>CBG</u>

THYMELAEACEAE

Pimelea filiformis Hook.f. CBG

Pimelea physodes Hook. CBG

UMBELLIFERAE

Aciphylla procumbens (F.Muell.) Benth. K

Oschatzia cunelfolia (F.Muell.) Drude CBG

URTICACEAE

Boehmeria calophleba C.Moore & F.Muell. CBG

VIOLACEAE

Viola cunninghamii Hook.f. MB+, UPS

WINTERACEAE

Tasmannia purpurascens (Vick.) A.C.Smith CBG+

Tasmannia stipitata (Vick.) A.C.Smith CBG

XANTHORRHOEACEAE

Lomandra patens A.Lee CBG+

Xanthorrhoea brunonis Endl. UPS

ZINGIBERACEAE

Amomum dallachyi F.Muell. WAI

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CODE

INSTITUTION

AA	Main Botanical Garden of Kazakh Ac. of Sciences, ALMA-ATA 70, Kazakh SSR, USSR.
AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
AMD	Hortus Botanicus of the University of Amsterdam, Plantage Middenlaan 2, 1018 DD AMSTERDAM, The Netherlands.
B	Botanischer Garten Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BATU	Batumi Botanical Garden of the Georgian Academy of Sciences, BATUMI, Machindzauri, Georgian SSR; U.S.S.R.
BERN	Botanischer Garten der Universitat, Altenbergrain 21, CH-3013 BERN, Switzerland.
BGAAS	Botanical Garden, Armenian Academy of Sciences, P.O. Avan, 375063 YEREVAN, Armenian SSR, U.S.S.R.
BLAN	Jardin Botanico Marimurta, Fundacion Carlos Faust, Estacion Int. de Biología Mediterranea, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universitat, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
BRES	Conservatoire Botanique de Stangelard h, 29200 BREST, France.
BRIST	University of Bristol Botanic Garden, Department of Botany, Woodland Road, BRISTOL BS8 1UG, U.K.
CBG	Canberra National Botanic Gardens, CANBERRA, A.C.T. 2601, Australia.
CGG	Cambridge University Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
CHRC	Christchurch Botanic Gardens, Parks and Recreations Department, City Council, P.O. Box 237, CHRISTCHURCH, New Zealand.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Ireland.



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 10

THE BOTANIC GARDENS LIST OF ENDEMIC SPECIES OF THE ISLANDS OF THE WESTERN INDIAN OCEAN

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, March 1984

INTRODUCTION

Since August 1982 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of endemic species of islands of the western Indian Ocean, namely Socotra, Reunion, Mauritius, Rodrigues and the Seychelles.

So far a total of 148 of the 740 species listed have been reported in cultivation by members of the 'Body'. These include 4 species of Cyathea (tree-ferns), not included on that list but on an earlier list of tree-ferns from the Old World.

The flora of each of the islands is in danger. Perhaps most acute is Mauritius, where most of the natural vegetation has been destroyed and many of the numerous endemics are reduced to a handful of individuals. Here IUCN/WWF, under their Plants Programme, have sponsored a one-year study of the problem by biologist, Wendy Strahm, working under the guidance of the Mauritian conservation authorities, in particular Dr Owadally. Ms Strahm is attempting to find out which patches of vegetation remain and make a plan as to how they can be saved. The implementation of this will form the second phase. At the same time she is undertaking urgent rescue of critically endangered plants and co-ordinating their ex situ conservation on the island. The present study will form a useful contribution to this major effort, which IUCN and WWF hope will itself be a useful model on how to resume critically endangered island floras.

Hugh Synge

This report gives the information we have to date. It is in two sections.

The first part is the list that gives the names of endemic species from the Western Indian Ocean Islands so far identified as grown in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

Second are the names and addresses of the botanic gardens which hold material of the listed species, with their codes.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

The Royal Botanic Gardens, Kew (code K) will be pleased to propagate and distribute to other members on quest any species marked on the list as growing at Kew.

K e y

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

ENDEMIC SPECIES OF THE WESTERN INDIAN OCEAN

PTERIDOPHYTA

CYATHEACEAE

<u>Cyathea borbonica</u> Desv. var. <u>borbonica</u>	<u>BR</u>
<u>Cyathea excelsa</u> O.Swartz	dbn
<u>Cyathea glauca</u> Bory	<u>BR</u>
<u>Cyathea sechellarum</u> Mett.	<u>K</u>

ANGIOSPERMAE

ACANTHACEAE

<u>Ballochia rotundifolia</u> Balf.f.	<u>K</u>
<u>Ruellia insignis</u> Balf.f.	BRES, <u>K</u>

AIZOACEAE

<u>Delosperma napiforme</u> (N.E.Br.) Schwantes	<u>BRES+</u>
<u>Tetragonia pentandra</u> Balf.f.	AA, TRES+

AMARYLLIDACEAE

<u>Crinum balfourii</u> Baker	<u>PRE</u>
<u>Crinum mauritianum</u> Lodd.	AA, <u>BRES+</u> , <u>CGG+</u> , <u>E</u> , <u>FTG</u> , <u>K</u> , <u>PRE</u> , <u>WAI</u>

ANACARDIACEAE

<u>Rhus thyrsoflora</u> Balf.f.	<u>K</u>
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ARACEAE

<u>Protarum sechellarum</u> Engl.	<u>K</u> , <u>NCY</u>
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ASCLEPIADACEAE

<u>Caralluma dioscoridis</u> Lavranos	BRES+, <u>K</u> , <u>KIEL</u> , <u>PRE</u> , <u>ZSS</u>
<u>Toxocarpus schimperianus</u> Hemsley	<u>BRES</u>

BALSAMINACEAE

<u>Impatiens gordonii</u> Horne ex Baker	<u>K</u>
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Impatiens thomassetii Hook.f. BRES+

BEGONIACEAE

Begonia seychellensis Hemsley BERN, BRES, E, GBG, K, MTJB, WAG

Begonia socotrana Hook.f. AD, B, BERN, bg, BOCH, BR, DUSS, GBG, kiel, LE, MB+, UPS

BORAGINACEAE

Trichodesma scottii Balf.f. K, PRE

BURSERACEAE

Boswellia elongata Balf.f. K

Boswellia nana Hepper K

Commiphora planifrons (Balf.f.) Engl. K, PRE

Protium obtusifolium (Lam.) Marchand WAI

CAMPANULACEAE

Berenice arguta Tul. BRES

Heterochaenia ensifolia (Lam.) DC. BRES

Heterochaenia rivalsii Badre & Cadet BRES

Lobelia serpens Lam. var. puberula E.Wimm. BRES+

Lobelia vagans Balf.f. BRES+

CELASTRACEAE

Elaeodendron orientale Jacq. br, FTG, HK, WAI

Pleurostylia leucocarpa Baker K

COMBRETACEAE

Terminalia bentzoe (L.) L.f. subsp. rodriguensis Wickens BRES

COMPOSITAE

Gynura sechellensis (Baker) Hemsley K, WAI

Kleinia scottii (Balf.f.) Chiov. BRES, PRE

CRASSULACEAE

Kalanchoe farinacea Balf.f. BRES, K, PRE

Kalanchoe robusta Balf.f. K, PRE

CUCURBITACEAE

Dendrosicyos socotranus Balf.f. PRE

CUNONIACEAE

Weinmannia tinctoria J.E.Smith BR

EBENACEAE

Diospyros diversifolia Hiern K

Diospyros egrettarum I.Richardson NCY

Diospyros leucomelas Poiret K

ERIOCAULACEAE

Eriocaulon striatum Lam. BOCH

EUPHORBIACEAE

Acalypha integrifolia Willd. subsp.
panduriformis Coode AA

Acalypha integrifolia Willd. var.
integrifolia BRES, K, U

Euphorbia abdelkuri Balf.f. PRE, ZSS

Euphorbia arbuscula Balf.f. MB+, PRE

Euphorbia leptoclada Balf.f. UPS

Euphorbia socotrana Balf.f. K

Euphorbia spiralis Balf.f. K

GENTIANACEAE

Exacum affine Balf.f. b, BERN, bg, BR, BRES, DELF, DUSS,
FRP, gbg+, HK, KIEL, l+, LAU,
livc, MB+, mil, NY, OULU, RIGA,
TRES, TUR+, ups

Exacum caeruleum Balf.f. PRE

GRAMINEAE

<u>Garnotia sechellensis</u> C.E.Hubb & Summerh.	<u>BRES</u>
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HYPOXIDACEAE

<u>Curculigo rhizophylla</u> (Baker) T.Durand & Schinz	<u>E</u> , <u>K</u>
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<u>Curculigo</u> sp.	AA, <u>BRES</u>
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LECYTHIDACEAE

<u>Foetidia mauritiana</u> Lam.	<u>BR</u>
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<u>Foetidia rodriguesiana</u> F.Friedmann	<u>BRES</u>
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LILIACEAE

<u>Aloe forbesii</u> Balf.f.	<u>K</u> , <u>PRE</u>
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<u>Aloe perryi</u> Baker	BR, <u>K</u> , <u>PRE</u>
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<u>Aloe squarrosa</u> Baker	<u>K</u> , <u>PRE</u> , SDZO+, TUR
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<u>Cordyline mauritiana</u> (Lam.) J.F.Macbride	<u>BR</u> , <u>K</u> , <u>WAI</u>
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<u>Dracaena cinnabari</u> Balf.f.	FTG, <u>K</u>
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<u>Dracaena concinna</u> Kunth	<u>BRES</u> , FTG
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<u>Dracaena floribunda</u> Baker	<u>BRES</u> , <u>K</u> , <u>NCY</u> , WAG
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<u>Lomatophyllum lomatophylloides</u> (Balf.f.) Marais	<u>BRES</u> +, <u>E</u> , <u>K</u> , <u>NCY</u> , <u>PRE</u> , <u>WAI</u> , ZSS
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<u>Lomatophyllum macrum</u> (Haw.) Salm-Dyck	amd, b, br, <u>BRES</u> , c+, HEID, <u>K</u> , MO, <u>WAI</u> , ZSS
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<u>Lomatophyllum purpureum</u> (Lam.) Th. Dur. & Schinz	<u>BRES</u> , dbn, <u>E</u> , <u>K</u> , <u>PRE</u> , <u>WAI</u>
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<u>Lomatophyllum tormentorii</u> Marais	<u>BRES</u> , <u>E</u> , <u>K</u> , <u>WAI</u>
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LYTHRACEAE

<u>Tetrataxis salicifolia</u> (Thouars ex Tul.) Baker	<u>BRES</u> +, <u>K</u>
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MALVACEAE

<u>Hibiscus boryanus</u> DC.	<u>BRES</u> , <u>WAI</u>
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<u>Hibiscus columnaris</u> Cav.	<u>BRES</u> , <u>K</u> , <u>WAI</u>
<u>Hibiscus fragilis</u> DC.	<u>BRES+</u> , <u>NCY</u>
<u>Hibiscus genevii</u> Bojer ex Hook.	<u>BRES</u> , <u>WAI</u>
<u>Hibiscus liliiflorus</u> Cav.	<u>WAI</u>
<u>Hibiscus scottii</u> Balf.f.	<u>BRES</u> , <u>CGG+</u> , <u>K</u> , <u>PRE</u> , <u>WAI</u>
<u>Hibiscus socotranus</u> Lucas	<u>PRE</u>
MEDUSAGYNACEAE	
<u>Medusagyne oppositifolia</u> Baker	<u>BERN+</u> , <u>K</u>
MENISPERMACEAE	
<u>Cocculus balfourii</u> Schweinf.	<u>K</u>
MORACEAE	
<u>Dorstenia gigas</u> Schweinf.	<u>CGG</u> , <u>K</u> , <u>PRE</u> , <u>ZSS</u>
MYOPORACEAE	
<u>Myoporum mauritianum</u> A.DC.	<u>BRES</u> .
MYRSINACEAE	
<u>Badula balfouriana</u> (Kuntze) Mez	<u>BRES</u>
<u>Badula barthesia</u> (Lam.) A.DC.	<u>BRES</u>
<u>Embelia angustifolia</u> (A.DC.) A.DC.	<u>BRES</u> , <u>K</u>
MYRTACEAE	
<u>Eugenia obovata</u> Poir.	dbn
<u>Psiloxylon mauritianum</u> (Bouton ex Hook.f.) Baillon	<u>BRES+</u>
<u>Syzygium glomeratum</u> (Lam.) DC.	<u>BRES</u>
NEPENTHACEAE	
<u>Nepenthes pervillei</u> Blume	B
ORCHIDACEAE	
<u>Agrostophyllum occidentale</u> Schltr.	<u>K</u>
<u>Angraecum maheense</u> Schltr.	<u>NCY</u>

Bulbophyllum intertextum Lindley K, NCY

Platylepis sechellarum S.Moore ex Baker NCY

Vanilla phalaenopsis Reichenb.f. BR, FRP, K

PALMAE

Acanthophoenix rubra (Bory) H.A.Wendl. FTG

Deckenia nobilis H.A.Wendl. ex Seemann FTG, SDZO

Dictyosperma album H.A.Wendl. & Drude ex Scheffer BR, K, LE, MTJB, SDZO, U

Hyophorbe amaricaulis Martius DBN, MTJB

Hyophorbe indica Gaertner LE

Hyophorbe lagenicaulis (L.Bailey) H.Moore AD, FTG+

Hyophorbe vaughanii L.Bailey LE

Hyophorbe verschaffeltii H.A.Wendl. AD, BRES, DELF, FTG, K, LE, mil, MTJB, PRE, SDZO, U, WAG

Latania loddigesii Martius B, BR, DELF, FRP, FTG, K, MTJB, NCY, PRE, SDZO, U, WA, WAG, WAI

Latania lontaroides (Gaertner) H.Moore B, BR, FTG

Latania verschaffeltii Lemaire FTG, LE, SDZO

Lodoicea maldivica (J.Gmelin) Pers. FTG, K

Nephrosperma vanhoutteanum (Wendl. ex Van Houtte) Balf.f. BR

Phoenicophorium borsigianum (K.Koch) Stuntz FTG, SDZO

Verschaffeltia splendida H.A.Wendl. BR, K, PRE, SDZO

PANDANACEAE

Pandanus balfourii Martelli FTG

Pandanus hornei Balf.f. B, K

Pandanus sechellarum Balf.f. K

PITTOSPORACEAE

<u>Pittosporum balfourii</u> Cufod.	<u>BRES+</u>
<u>Pittosporum senacia</u> Putterl. subsp. <u>senacia</u>	<u>BR, WAI</u>
<u>Pittosporum senacia</u> Putterl. subsp. <u>reticulatum</u> (Tul.) Coode	<u>BRES+</u>
<u>Pittosporum wrightii</u> Hemsley	k

PUNICACEAE

<u>Punica protopunica</u> Balf.f.	<u>BRES, CGG+, k, PRE, SDZO</u>
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RHAMNACEAE

<u>Gouania leguatii</u> Gueho	<u>BRES+</u>
<u>Gouania mauritiana</u> Lam. var. <u>mauritiana</u>	<u>BRES</u>

RUBIACEAE

<u>Doricera trilocularis</u> (Balf.f.) Verdc.	<u>BRES</u> ,
<u>Mussaenda arcuata</u> Poiret	E, <u>LASCA+</u>
<u>Rothmannia annae</u> (E.Wright) Keay	<u>CGG+, K, NCY</u>
<u>Scyphochlamys revoluta</u> Balf.f.	<u>K</u>

RUTACEAE

<u>Zanthoxylum heterophyllum</u> (Lam.) Smith	<u>NCY</u>
<u>Zanthoxylum paniculatum</u> Balf.f.	<u>K</u>

SAPINDACEAE

<u>Hornea mauritiana</u> Baker	<u>WAI</u>
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SAPOTACEAE

<u>Labourdonnaisia calophylloides</u> Bojer	<u>BR, NCY</u>
<u>Mimusops maxima</u> (Poiret) Vaughan	<u>BR</u>
<u>Sideroxylon cinereum</u> Lam.	<u>WAI</u>

SCROPHULARIACEAE

<u>Bryodes micrantha</u> Benth.	<u>BRES</u>
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SOLANACEAE

Withania riebeckii Schweinf. BRES, K, NCY

STERCULIACEAE

Dombeya acutangula Cav. subsp. rosea BRES, NCY
Friedm.

Dombeya acutangula Cav. var. BRES
acutangula

Dombeya mauritiana Friedm. BRES

Ruizia cordata Cav. BRES

Trochetia blackburniana Bojer BRES

Trochetia boutoniana Friedm. BRES

Trochetia granulata Cordem. BRES

TURNERACEAE

Mathurina penduliflora Balf.f. BRES

URTICACEAE

Elatostema fagifolium (Poirot) Brongn. BR

Obetia ficifolia (Poirot) Gaudich BRES+

Pilea atroviridis Baker ups

Pilea cocottei Marais BRES+

Pilea laevicaulis Wedd. BRES+

Pilea umbellata (Bory) Wedd. ups

Pouzolzia laevigata (Poirot) Gaudich. BRES+, K

VERBENACEAE

Clerodendron laciniatum Balf.f. BRES+

VITACEAE

Cissus hamaderoensis R.-Smith K, mil, ZSS

Cissus paniculata (Balf.f.) Planchon K

Cissus subaphylla (Balf.f.) Planchon K, MB

INDEX OF GARDEN CODES

- AA Central Botanical Garden of Kazakh Ac. of Sciences, Alma-Ata 65, Kazakh SSR, U.S.S.R.
- AD Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
- AMD Hortus Botanicus of the University of Amsterdam, Plantage Middenlaan 2, 1018 DD AMSTERDAM, The Netherlands.
- B Botanischer Garten Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
- BERN Botanischer Garten der Universitat, Altenbergrain 21, CH-3013 BERN, Switzerland.
- BG Botanisk Hage, P.O. Box 12, N-5014 BERGEN, Norway.
- BOCH Botanischer Garten Ruhr-Universitat, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
- BR Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
- BRES Conservatoire Botanique de Stangelarc'h, 29200 BREST, France.
- C Kobenhavns Universitets Botaniske Have, O Farimagsgade 2B, DK-1353 KOBENHAVEN, Denmark.
- CGG Cambridge University Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
- DBN National Botanic Gardens, Glasnevin, DUBLIN 9, Ireland.
- DELFT Cultuurtuin voor Technisch Gewassen, Technisch Hogeschool Delft, Julianalaan 67, Postbus 5057, 2600 GB DELFT, The Netherlands.
- DUSS Botanischer Garten der Universitat Dusseldorf, Universitatstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
- E Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.
- FRP Palmengarten der Stadt Frankfurt, Siesmayerstrasse 61, 6000 FRANKFURT AM MAIN-1, Federal Republic of Germany.
- FTG Fairchild Tropical Garden, 10901 Old Cutler Road, MIAMI, Florida 33156, U.S.A.
- GBG Glasgow Botanic Gardens, GLASGOW G12 0UE, U.K.
- HEID Botanischer Garten der Universitat Heidelberg, Im Neuenheimer Feld 340, D-6900 HEIDELBERG, Federal Republic of Germany.

HK	Agriculture and Fisheries Department, 393 Canton Road, 12/F, KOWLOON, Hong Kong.
K	Royal Botanic Gardens, Kew, RICHMOND, Surrey TW9 3AB, U.K.
KIEL	Botanischer Garten der Universität Kiel, Olshausenstrasse 40-60, Biologie zentrum, D-2300 KIEL, Federal Republic of Germany.
L	Leiden University Botanic Garden, Nonnensteeg 3, 2311 VJ LEIDEN, The Netherlands.
LASCA	State and County Arboretum, Arcadia, 301 North Baldwin Avenue, ARCADIA, California 91006, U.S.A.
LAU	Jardin Botanique de Lausanne, 14 bis, Avenue de Cour, CH-1007 LAUSANNE, Switzerland.
LE	Botanical Garden, Komarov Botanical Institute, Professor Popov Street 2, 197022 LENINGRAD 22, U.S.S.R.
LIVC	Liverpool City Botanic Gardens, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
MB	Botanischer Garten der Philipps-Universität, Auf den Lahnbergen, 3550 MARBURG, Federal Republic of Germany.
MIL	Mitchell Park Conservatory, 524 South Layton Boulevard, MILWAUKEE Wisconsin 53215 U.S.A.
MO	Missouri Botanical Garden, P.O. Box 299, St Louis, MISSOURI 63166, U.S.A.
MTJB	Jardin Botanique de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
NCY	Jardins Botaniques de Nancy, 100, Rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NY	The New York Botanical Garden, Bronx, New York 10458, U.S.A.
OULU	Botanical Garden, Department of Botany, University of Oulu, Box 191, SF-90101 OULU 10, Finland
PRE	Pretoria National Botanic Garden, Dept. of Agricultural Technical Services Botanical Research Institute, Private Bag X101, PRETORIA, South Africa 001.
RIGA	Botanical Garden, Latvian Academy of Sciences, 229021 Riga P.O. SALASPILS, Latvia, U.S.S.R.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
TRES	Tresco Abbey Gardens, Tresco, Isles of Scilly, Cornwall.

- TUR University of Turku Botanical Garden, SF-20500 TURKU 50, Finland.
- U Utrecht University Botanical Gardens, Transitorium 2, Heidelberglaan 2, 3508 TC - UTRECHT, The Netherlands.
- UPS Uppsala Botanic Garden, Villavagen 8, S-75236 UPPSALA, Sweden.
- WA Warsaw University Botanic Garden, Al. Ujazdowskie 4, 00-478 WARSAW, Poland.
- WAG Belmonte Arboretum and Botanical Gardens, Agricultural University, Generaal Foulkesweg 37, 6703 BL WAGENINGEN, The Netherlands.
- WAI Waimea Arboretum & Botanical Garden, Park Office, 59-864 Kamehameha Highway, Haleiwa, HAWAII 96712, U.S.A.
- ZSS Stadtische Sukkulentsammlung Zurich, Mythenquai 88, 8002 ZURICH, Switzerland.



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

REPORT NO. 11

THE BOTANIC GARDENS LIST OF RARE AND THREATENED SPECIES OF THE GALAPAGOS AND JUAN FERNANDEZ ISLANDS

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, March 1984

INTRODUCTION

Since February 1983 we have sent to all members of the Botanic Gardens Conservation Co-ordinating Body a list of Rare and Threatened Species of the Galapagos and Juan Fernandez Islands.

Of the 232 species listed only 31 have been reported in cultivation. This is a rather low number, but not entirely unexpected; despite their considerable botanical interest, few if any of the species would make garden plants and one suspects most are difficult to cultivate. So the data incorporated in this report are a useful beginning.

Of the two floras, that of Juan Fernandez - the Robinson Crusoe Islands - is in the most peril, threatened by feral goats, pigs, sheep, rabbits and even horses that run rampant over the islands, and, more serious by vigorous invasive plants such as common blackberry (Rubus). One expert estimates that if nothing is done the flora will disappear in the next ten years. Prompted by IUCN, the Chilean conservation authorities have prepared an ambitious plan to save the flora by a mixture of in situ and ex situ conservation. This is part of the IUCN/WWF Plant Conservation Programme, and under the Plants Campaign WWF is seeking to raise about US\$100,000 for it. More details are available from the IUCN Plants Officer in Gland on request.

Whereas the Galapagos flora has more endemic species, it is not in such great danger. There is already a large conservation programme on the islands, run by the Galapagos National Park Service and supported by the Charles Darwin Research Station. IUCN/WWF have given financial support to these activities for many years and will continue to do so under their Plants Programme. The main emphasis is on eradication of the feral animals that continue to threaten both the endemic flora and fauna.

So, for these two island groups, knowledge on the holdings of botanic gardens forms an important component of the overall conservation strategy.

Hugh Synge

This report gives the information we have to date. It is in two sections.

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RARE AND THREATENED PLANTS OF
THE GALAPAGOS AND JUAN FERNANDEZ ISLANDS

PTERIDOPHYTA

CYATHEACEAE

Thyrsopteris elegans Kunze gbg

ANGIOSPERMAE

AMARANTHACEAE

Pleuropetalum darwinii Hook.f. B, BERN, U+

CACTACEAE

Jasminocereus thouarsii (F.A.C.Weber) u
Backeb. var. thouarsii

Opuntia echios J.Howell var. echios U

Opuntia echios J.Howell var. K
barringtonensis E.Dawson

Opuntia echios J.Howell var. K
(J.Howell) D.Porter

Opuntia echios J.Howell var. U
(J.Howell) E.F.Anders. & Walk.

Opuntia galapageia Henslow var. B, ZSS
galapageia

Opuntia megasperma J.Howell var. U
megasperma

COMPOSITAE

Dendroseris litoralis Skotts. B+, MB

Dendroseris macrophylla D.Don AD, BRES

CONVOLVULACEAE

Ipomoea tubiflora Hook.f. BATU

CRUCIFERAE

Cardamine kruesselii Johow BATU

ERICACEAE

Pernettya howellii Sleumer SUCH

ESCALLONIACEAE

Escallonia callcottiae Hook. & Arn. SUCH

EUPHORBIACEAE

Acalypha flaccida Hook.f. SUCH, TBI

Acalypha velutina Hook.f. AA

Croton scouleri Hook.f. var.
brevifolius (Andersson) Muell. Arg. AA, TBI

Croton scouleri Hook.f. var.
grandifolius Muell. Arg. TBI

FLACOURTIACEAE

Azara fernandeziana C.Gay SUCH

HALORAGACEAE

Haloragis masafuerana Skottsb. BRES

LABIATAE

Cuminia fernandezia Colla K

MYRTACEAE

Psidium galapageium Hook.f. var.
howellii D.Porter SDZO

Ugni selkirkii (Hook. & Arn.) O.Berg SUCH

PIPERACEAE

Peperomia berteriana Miq. TBI

Peperomia galapagensis Hook.f. ex Miq.
var. ramulosa (Andersson) Yuncker TBI

Peperomia petiolata Hook.f. TBI

RHAMNACEAE

Colletia spartioides Bertero ex Colla SUCH

UMBELLIFERAE

Apium fernandezianum Johow

BRES

URTICACEAE

Boehmeria excelsa (Bertero ex Steudel)
Wedd.

SUCH, TBI

VERBENACEAE

Rhaphithamnus venustus (Philippi)
Robinson

K

INDEX OF GARDEN CODES

AA	Central Botanical Garden of Kazakh Ac. of Sciences, Alma-Ata 65, Kazakh SSR, USSR
AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
B	Botanischer Garten Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BATU	Batumi Botanical Garden, Georgian Academy of Sciences, BATUMI Machindzauri, Georgia, U.S.S.R.
BERN	Botanischer Garten der Universitat, Altenbergrain 21, CH-3013 BERN, Switzerland.
BRES	Conservatoire Botanique de Stangelarc'h, 29200 BREST, France.
GBG	Glasgow Botanic Gardens, GLASGOW G12 0UE, U.K.
K	Royal Botanic Gardens, Kew, RICHMOND, Surrey TW9 3AB, U.K.
MB	Botanischer Garten der Philipps-Universitat, Auf den Lahnbergen, 3550 MARBURG, Federal Republic of Germany.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
SUCH	Sukhumi Botanical Garden, Georgian Academy of Sciences, Chavchavadze Street 20, 384933, SUKHUMI, Georgia, U.S.S.R.
TBI	Tbilisi Central Botanical Garden, 380005, TBILISI P05, Georgia, U.S.S.R.
U	Utrecht University Botanical Gardens, Transitorium 2, Heidelberglaan 2, 3508 TC - UTRECHT, The Netherlands.
ZSS	Stadtische Sukkulentsammlung Zurich, Mythenquai 88, 8002 ZURICH, Switzerland.



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 12

THE BOTANIC GARDENS LIST OF RARE AND THREATENED SPECIES OF EUROPE

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM MEMBERS OF THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

—
KEW, August 1984

INTRODUCTION

In July 1978 we sent the first list of European threatened plants to botanic gardens, based upon IUCN data published in the 1977 version of the "List of Rare, Threatened and Endemic Plants in Europe". We asked the gardens to indicate which species they had in cultivation and whether they were from a known wild source. The results of this survey were published the following year.

Since then many other gardens have screened the list and indicated their holdings from it. Furthermore a thorough revision of the original 1977 threatened plant list was published in 1983^{*}; from this we prepared and circulated in March 1983 a supplement of additional taxa and taxonomic changes. It seems an appropriate time, therefore, to issue an updated version of garden holdings.

You will see that the holdings of many gardens are indicated as from unknown source (marked by the garden code being in lower case). Many of these plants may in fact be of known cultivated source (upper case, no underline), since this designation was not one of the categories on the earlier request.

Of the 2361 taxa threatened throughout Europe, approximately 30% (750 taxa), listed here, have been reported to be in cultivation by subscribers to the 'Body'. This is an encouragingly high proportion and many European botanic gardens are becoming increasingly aware and active in conservation projects, especially at a local level.

Our recent and more detailed examination of the data reveals that as much as 32% (345 rare or threatened taxa) occur in no more than one garden. Here there is a tremendous opportunity for gardens to contribute further through the 'Body', to the long term survival of these plants by bulking them up and distributing them to other subscribing gardens.

* Threatened Plants Unit (1983). List of rare, threatened and endemic plants in Europe (1982 edition). Nature and Environment Series No. 27. Council of Europe, Strasbourg. 357 pp. Available from Council of Europe Publications Division, BP 431 R6, F-67006 Strasbourg Cedex, France. Price: FF48 (£6.00).

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RARE AND THREATENED PLANTS OF EUROPE

PTERIDOPHYTA

ASPIDIACEAE

- Cystopteris sudetica A.Braun & Milde b, GB, GORK, LDS, LE, LECB, rig, Z
- Diplazium caudatum (Cav.) Jermy K, LE, LECB, mb, Z
- Diplazium sibiricum (Turcz. ex Kunze) Kurata GB, KPABG, O, OULU
- Dryopteris fragrans (L.) Schott E

ASPLENIACEAE

- Asplenium adulterinum Milde b, BERN, BG, duss, ER, LDS, LI, mb, PRC, UPS, WRSL, Z
- Asplenium hemionitis L. B, bg, frt, K, kiel, LDS, mb, ORT, Z
- Phyllitis hybrida (Milde) Christensen b, DUSS, lju

HYMENOPHYLLACEAE

- Trichomanes speciosum Willd. boch, brist, CGG, dbn, gbg, hal, k, lds, LIVC, mb

ISOETACEAE

- Isoetes boryana Durieu BRES
- Isoetes malinverniana Ces. & De Not. Z

MARSILEACEAE

- Marsilea quadrifolia L. avu, b, bern, besn, bg, blan, boch, cgg, dbn, duss, er, fb, frt, g, gbg, hal, hbg, HK, HKUS, hlu, IAGB, k, kiel, lau, li, livc, lju, mb, mha, neu, oulu, prc, rng, sta, str, trh, tur, u, wa, wag, wrsl, Z
- Marsilea strigosa Willd. bern, bres, GBG, livc
- Pilularia globulifera L. avu, b, bern, besn, BG, bmbg, boch, br, BRIST, C, dbn, dr, duss, E, er, fb, frt, g, gbg, GENT, hal, hbg, HLU, K, KIEL, lau, LDS, LIVU, str, tcd, u, UPS, wa, wag, Z

OPHIOGLOSSACEAE

Botrychium multifidum (S.G.Gmelin)
Rupr.

KPABG, OULU, SVER, UBC

Botrychium virginianum (L.) Swartz

SVER, UBC, z

PSILOTACEAE

Psilotum nudum (L.) Beauv.

amd, avu, bg, boch, br, brist,
CGG, delf, duss, E, frt, gbg, HK,
HKUS, hlu, K, lau, lds, mb, mha,
pru, sta, tcd, u, wa, wag

PTERIDACEAE

Pteris cretica L.

AD+, BRIS, cgg, DELF, gbg, HK,
HKUS, K, l, LAU, MB+, mil, MTJB,
ORT+, pav, SDZO, tcd, tres, u+,
wa, wag

Pteris dentata Forssk.

k, lisjc, wa

Pteris serrulata Forssk.

besn, k, LAU, mb

THELYPTERIDACEAE

Christella dentata (Forssk.) Brownsey
& Jermy

B, br, brist, gbg, K, LDS, ma, mb,
STA

GYMNOSPERMAE

CUPRESSACEAE

Juniperus drupacea Labill.

CGG, k, palz, rot, tbi, wesb

Tetraclinis articulata (Vahl) Mast.

avu, bern, br, brist, CBG, dbn,
fru, hal, hye, k, kiel, MA, mb,
mha, neu, oulu, RNG+, sta, tur,
WTU

PINACEAE

Abies nebrodensis (Lojac.) Mattei

avu, B, E, GB, palz, u, wtu

Abies pinsapo Boiss.

B, batu, BERN, besn, blan, boch,
brist, CGG, dbn, delf, DHM, duss,
E, fru, gb, harr, HYE, k, kiel,
lisjc, MA, neu, npnz, palz, sta,
str, tash, tbi, teg, tim, tres, u,
ubc, ups, wsy, wtu, yalt, z

Picea omorika (Pancic) Purkyne

avu, b, batu, bern, besn, bg,
boch, br, brist, CGG, dbn, DHM,
duss, E, fru, GB, hal, harr, k,
kaun, kwha, lau, livc, lju, mha,
msk, mw, npnz, palz, prc, rig,
riga, RNG, rot, sbg, sta, str,
tali, tash, tbi, tcd, teg, tim,
trh, tur, u, ubc, ups, wa, wag,
wesb, wi, wsy, WTU, z

ANGIOSPERMAE

ALISMATACEAE

Alisma wahlenbergii (O.R.Holmberg)
Juzepczuk

UPS

Echinodorus repens (Lam.) Kern &
Reichg.

wag

Luronium natans (L.) Raf.

dbn, mb, UPS

ALTINGIACEAE

Liquidambar orientalis Miller

ATHD, b, batu, bern, cgg, dbn,
duss, E, frt, fru, hye, k, NEU,
nnpz, palz, rot, sta, ups, WAG,
wsy, z

AMARYLLIDACEAE

Galanthus cilicicus Baker

WSY

Galanthus ikariae Baker

bg, brist, dbn, E, gb, hal, K,
kiel, sta, tall, u, wag, wsy

Galanthus plicatus M.Bieb.

ad, altg, aubsn, b, BERN, bg,
bkur, br, brist, CGG, CHIS, dbn,
DTSK, E, gb, IAGB, K, khar, kiel,
KWHA, lau, le, li, MHA, MW, nalc,
rig, riga, sbg, str, tall, tcd, u,
wa, wsy, YALT

Galanthus reginae-olgae Orph.

bg, brist, cgg, E, GB, kiel, sta,
wsy

Leucojum longifolium (Gay ex Roemer)
Gren. & Godron

E, K

Leucojum nicaeense Ard.

alta, B, CGG, E, GB, gent, irvc,
K, latt, sta, wsy

Narcissus longispathus Pugsley

CGG, E, MA

Narcissus scaberulus Henriq.

alta, b, dbn, E, gb, kiel, u, ubc

Narcissus viridiflorus Schousboe

b, CGG, gb, irvc, k, lds, MA, wsy

APOCYNACEAE

Rhazya orientalis (Decaisne) A.DC.

amd, athd, b, dbn, e, gb, prc,
RNG, str, u, ubc, WAG, wsy, z

ARACEAE

Biarum davisii Turrill

wsy

Biarum spruneri Boiss.

B, GB, K

ARISTOLOCHIACEAE

Aristolochia bodamae Dingler

hal

ASCLEPIADACEAE

Caralluma europaea (Guss.) N.E.Brown

ad, avu, BERN, BLAN, BR, brist, E,
gbg, gent, hal, K, kiel, mb, ort,
prc, RNG, sta, trh, ups

Caralluma munbyana (Decaisne)
N.E.Brown

chis

BERBERIDACEAE

Gymnospermium altaicum (Pallas) Spach

CGG

BETULACEAE

Betula humilis Schrank

b, BERN, br, dbn, DHM, dr, er,
frt, fru, gork, hal, K, kiel, KL,
kwha, LAU, li, MESH, MHA, MSK, mw,
NEU, oulu, prc, riga, rot, str,
tash, teg, TK, u, vor, WA, WAG,
wrsl, wsy, wtu, z

BORAGINACEAE

Anchusa cespitosa Lam.

E, STA, ubc, wsy

Buglossoides gastonii (Benth.)
I.M.Johnston

lau, sta

Halacsya sendtneri (Boiss.) Doerfler

boch, E, gb, K, kiel, mb

<u>Lithodora nitida</u> (H.Ern) R.Fernandes	<u>B</u>
<u>Lithodora oleifolia</u> (Lapeyr.) Griseb.	b, besn, bres, brist, cgg, E, lau
<u>Lithodora zahnii</u> (Heldr.) I.M.Johnston	brist, <u>CGG</u> , k
<u>Lithospermum goulandrionum</u> Rech.f.	<u>GB</u>
<u>Moltkia doerfleri</u> Wettst.	b, E, gb, hal, k, kiel, lau, u
<u>Myosotis rehsteineri</u> Wartm.	b, CGG, z
<u>Myosotis ruscinonensis</u> Rouy	<u>BRES</u> , <u>HYE</u>
<u>Omphalodes littoralis</u> Lehm.	<u>BRES</u> , cgg
<u>Omphalodes luciliae</u> Boiss.	<u>B</u> , brist, CGG, E, k, lau, neu, rng, ubc
<u>Onosma pseudarenaria</u> Schur	neu, prc
<u>Onosma tornensis</u> S.Javorka	<u>BERN</u> , <u>UPS</u>
<u>Pulmonaria filarszkyana</u> S.Javorka	kwaha, li, tall
<u>Rindera graeca</u> (A.DC.) Boiss. & Heldr.	<u>GB</u> , mb

CAMPANULACEAE

<u>Campanula carpatha</u> Halacsy	ad, fru, k, nij, novb, tash
<u>Campanula elatinoides</u> Moretti	b, berg, <u>K</u> , <u>LAU</u> , ncy, <u>U</u>
<u>Campanula fenestrellata</u> Feer	ad, alta, <u>BERN</u> , besn, CGG, dbn, E, ELSL, frt, gb, k, kiel, kpabg, <u>LAU</u> , <u>LJU</u> , <u>NEU</u> , sta, str, u, wag, z
<u>Campanula forsythii</u> (Arcang.) Podlech	<u>NEU</u>
<u>Campanula hercegovina</u> Degen & Fiala	<u>NCY</u>
<u>Campanula incurva</u> Aucher ex A.DC.	alta, b, boch, br, <u>CGG</u> , <u>GB</u> , hal, k, kiel, kpabg, lau, mb, nij, <u>U</u> , wsy
<u>Campanula isophylla</u> Moretti	b, besn, brist, dbn, frt, <u>K</u> , kiel, <u>LAU</u> , le, mb, <u>NEU</u> , npnz, sta, tall, tres, ubc, ups, wī, wsy, z
<u>Campanula justiniana</u> Witasek	ad, boch, hal, kpabg, le, <u>LJU</u>
<u>Campanula laciniata</u> L.	fru

<u>Campanula lavrensis</u> (Tocl & Rohl.) Phitos	<u>K</u>
<u>Campanula morettiana</u> Reichenb.	<u>LAU</u>
<u>Campanula petraea</u> L.	bres, <u>LAU</u> , mb, <u>NCY</u> , <u>Z</u>
<u>Campanula portenschlagiana</u> J.A.Schultes	ad, alta, avu, b, <u>BERN</u> , besn, boch, br, dbn, e, <u>ELSL</u> , frt, gb, gbg, hal, harr, k, kiel, latt, <u>LAU</u> , lju, mb, <u>NEU</u> , rig, sta, str, tall, teg, tres, u, ubc, wag, wsy, z
<u>Campanula poscharskyana</u> Degen	alta, amd, avu, b, bern, boch, br, cgg, chic, dbn, E, frt, gb, harr, k, kaun, kiel, <u>LAU</u> , le, li, lju, neu, nij, rig, riga, str, tall, teg, u, ubc, ups, wa, wag
<u>Campanula raineri</u> Perp.	berg, bern, bg, br, <u>CGG</u> , <u>E</u> , <u>GB</u> , <u>K</u> , kaun, kiel, <u>LAU</u> , mb, <u>NCY</u> , <u>NEU</u> , rig, riga, tall, tur
<u>Campanula reiseri</u> Halacsy	b
<u>Campanula romanica</u> Savul.	lau
<u>Campanula rupestris</u> Sibth. & Smith	k, wsy
<u>Campanula rupicola</u> Boiss. & Spruner	<u>CGG</u>
<u>Campanula sartorii</u> Boiss. & Heldr.	b, k, ubc, wsy
<u>Campanula saxatilis</u> L.	ad, boch, k, lau, <u>NIJ</u>
<u>Edraianthus dalmaticus</u> (A.DC.) A.DC.	b, <u>BERN</u> , chic, <u>LAU</u> , li, oulu, rig, trh, ups, wa
<u>Edraianthus dinaricus</u> (A.Kerner) Wettst.	b, boch, E, lau, li, rig, sta, u, ups, wsy, z
<u>Edraianthus pumilio</u> (Portenschlag) A.DC.	b, bern, besn, bg, boch, <u>CGG</u> , frt, harr, k, kiel, <u>LAU</u> , <u>LI</u> , <u>NEU</u> , <u>NIJ</u> , prc, rig, sta, tall, u, ubc, wsy, z
<u>Physoplexis comosa</u> (L.) Schur	amd, avu, <u>B</u> , besn, <u>CGG</u> , <u>GB</u> , kiel, <u>KL</u> , <u>LAU</u> , mb, <u>NEU</u> , u, wag, wsy
<u>Phyteuma humile</u> Schleicher ex Gaudin	kiel, lau, <u>NIJ</u> , prc, tur

<u>Symphyandra cretica</u> A.DC.	b, k
<u>Symphyandra hofmannii</u> Pantocsek	b, bern, br, E, frt, gb, hal, k, kiel, lau, lju, ncy, riga, u, ubc, ups

<u>Symphyandra samothracica</u> (Degen) Halacsy	<u>TCD</u>
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<u>Trachelium asperuloides</u> Boiss. & Orph.	E
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<u>Trachelium jacquinii</u> (Sieber) Boiss.	ubc
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CAPRIFOLIACEAE

<u>Lonicera biflora</u> Desf.	k
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CARYOPHYLLACEAE

<u>Agrostemma gracilis</u> Boiss.	ELSL
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<u>Arenaria controversa</u> Boiss.	HYE
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<u>Arenaria hispida</u> L.	<u>NEU</u>
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<u>Arenaria huteri</u> A.Kerner	<u>LAU, NEU</u>
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<u>Arenaria lithops</u> Heywood ex McNeill	<u>B</u>
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<u>Arenaria nevadensis</u> Boiss. & Reuter	alta, hal, sta, ubc
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<u>Arenaria provincialis</u> Chater & Halliday	<u>CGG</u>
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<u>Arenaria pungens</u> Clemente ex Lag.	ad, <u>B</u> , besn, gb, hal, HYE, lau, mb, <u>NEU</u>
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<u>Arenaria rigida</u> M.Bieb.	ad, dbn
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<u>Bufonia perennis</u> Pourret	HYE
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<u>Cerastium alsinifolium</u> Tausch	fru
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<u>Cerastium runemarkii</u> Moschl & Rech.f.	fru
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<u>Cerastium theophrasti</u> Merxm. & Strid	<u>NEU</u>
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<u>Dianthus callizonus</u> Schott & Kotschy	<u>BERN</u> , boch, E, <u>GB</u> , hal, lau, mb, <u>NCY</u> , sta, ubc
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<u>Dianthus diutinus</u> Kit.	ad
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<u>Dianthus freynii</u> Vandas	E
<u>Dianthus fruticosus</u> L.	CGG, hal, <u>K</u>
<u>Dianthus gallicus</u> Pers.	<u>BERN</u> , <u>BESN</u> , boch, br, dbn, frt, <u>K</u> , <u>LAU</u> , nij, prc, str, tur, u
<u>Dianthus glacialis</u> Haenke subsp. <u>gelidus</u> (Schott, Nyman & Ky) Tutin	<u>E</u> , ncy
<u>Dianthus graniticus</u> Jordan	bern, boch, br, <u>ELSL</u> , frt, g, <u>GENT</u> , <u>HYE</u> , kaun, <u>LAU</u> , <u>NCY</u> , neu, <u>NIJ</u> , str, tbi, u
<u>Dianthus gratianopolitanus</u> Vill.	avu, B, <u>BERN</u> , besn, bg, boch, br, <u>BRIST</u> , <u>CGG</u> , dbn, <u>DR</u> , duss, E, <u>ELSL</u> , <u>ER</u> , fb, frt, fru, g, gb, <u>GENT</u> , hal, harr, hbg, <u>HYE</u> , k, kaun, <u>KIEL</u> , <u>LAU</u> , le, livc, mb, <u>NCY</u> , <u>NEU</u> , <u>PRC</u> , riga, shf, str, tall, tbi, teg, <u>TRH</u> , tur, u, ups, wi, wsy
<u>Dianthus juniperinus</u> Smith	ad, k
<u>Dianthus knappii</u> (Pantocsek) Aschers. et al	ad, alta, b, bern, besn, bg, CGG, dbn, duss, E, <u>ELSL</u> , gb, hal, k, kiel, latt, lau, li, ncy, ngoet, prc, rig, rng, str, tall, tash, tbi, tur, u, ups, wa, wag
<u>Dianthus myrtinervius</u> Griseb.	b, <u>UPS</u>
<u>Dianthus nardiformis</u> Janka	b, bern, boch, dbn, E, kiel, lau, li, z
<u>Dianthus pungens</u> L.	ad, boch
<u>Dianthus rupicola</u> Biv.	hal
<u>Minuartia grignensis</u> (Reichenb.) Mattf.	<u>NEU</u>
<u>Moehringia minutiflora</u> Bornm.	<u>CGG</u>
<u>Moehringia papulosa</u> Bertol.	<u>LAU</u>
<u>Petrorhagia alpina</u> (Habl.) P.W.Ball & Heywood	dbn
<u>Petrorhagia dianthoides</u> (S. & S.) P.W.Ball & Heywood	<u>RNG</u>

<u>Saponaria chlorifolia</u> Kunze	AD
<u>Silene bergiana</u> Lindman	BRES
<u>Silene brachypoda</u> Rouy	bres, str
<u>Silene campanula</u> Pers.	ad, kiel, <u>LAU</u>
<u>Silene cythnia</u> (Halacsy) Walters	mb
<u>Silene damboldtiana</u> Greuter & Melzh.	<u>B+</u> , <u>MB+</u>
<u>Silene diclinis</u> (Lag.) M.Lainz	<u>AVU</u> , <u>CGG</u>
<u>Silene dictaea</u> Rech.f.	mb
<u>Silene dinarica</u> Sprengel	ad, hal, lau
<u>Silene elegans</u> Link ex Brot.	<u>CGG</u> , HYE
<u>Silene elisabetha</u> Jan	b, berg, <u>BERN</u> , CGG, k, kiel, <u>LAU</u> , mb, ncy, ubc, z
<u>Silene giraldii</u> Guss.	k
<u>Silene goulimyi</u> Turrill	mb
<u>Silene haussknechtii</u> Heldr. ex Hausskn.	b, mb
<u>Silene hifacensis</u> Rouy ex Willk.	<u>BRES</u> , <u>HYE</u> , <u>K</u> , tres
<u>Silene linicola</u> C.C.Gmelin	frt, <u>HYE</u> , k, kon, ups
<u>Silene macrorhiza</u> Gay & Durieu ex Lacaita	<u>CGG</u>
<u>Silene niederi</u> Heldr. ex Boiss.	mb
<u>Silene oligantha</u> Boiss. & Heldr.	<u>MB+</u>
<u>Silene orphanidis</u> Boiss.	<u>TCD</u>
<u>Silene pindicola</u> Hausskn.	<u>GB</u> , <u>NCY</u>
<u>Silene schmuckeri</u> Wettst.	b, u
<u>Silene schwarzenbergeri</u> Halacsy	<u>B+</u> , <u>MB+</u>
<u>Silene stenocalycina</u> Rech.f.	mb
<u>Silene velutina</u> Pourret ex Loisel.	<u>BRES</u>

<u>Silene viscariopsis</u> Bornm.	ad, b, <u>CGG</u> , <u>K</u> , kiel, <u>LDS</u> , ngoet, <u>WAG</u>
<u>Silene zawadzkii</u> Herbich	ad, alta, avu, b, bern, besn, br, cgg, <u>CHER</u> , dbn, e, frt, gb, hal, harr, <u>IAGB</u> , kiel, lau, livc, lvop, <u>NEU</u> , <u>riga</u> , sta, str, trh, u, <u>UBC</u>
<u>Stellaria crassipes</u> Hulten	<u>TRH</u>
CELASTRACEAE	
<u>Euonymus nanus</u> M.Bieb.	askn, bela, br, <u>CGG</u> , chic, <u>CHIS</u> , dbn, dtsk, E, frt, hal, <u>IAGB</u> , k, kali, kiev, kwha, lau, ma, <u>MESH</u> , mha, msk, mw, oulu, rig, riga, sta, str, tall, tros, tu, tur, u, uman, ups, wag, wesb, wsy, <u>YALT</u>
CHENOPODIACEAE	
<u>Bassia hirsuta</u> (L.) Aschers.	b
<u>Beta nana</u> Boiss. & Heldr.	bg, <u>CGG</u> , nij, <u>TCD</u>
<u>Corispermum nitidum</u> Kit.	frt
<u>Kochia saxicola</u> Guss.	chis
CISTACEAE	
<u>Cistus albanicus</u> E.F.Warb. ex Heywood	ad, <u>B</u> , <u>BRES</u> , li, z
<u>Cistus heterophyllus</u> Desf.	ad, b, bak, boch
<u>Cistus palhinhae</u> Ingram	ad, blan, bmbg, bres, brist, dbn, e, palz, <u>RNG</u> , sdzo, sta, ubc
<u>Cistus varius</u> Pourret	<u>BRES</u> , <u>HYE</u>
<u>Helianthemum alypoides</u> Losa & Rivas Goday	<u>MA</u>
<u>Helianthemum stipulatum</u> (Forssk.) Christensen	<u>HYE</u>
COMPOSITAE	
<u>Achillea biebersteinii</u> Afanas.	ad, ngoet, str, tash, teg
<u>Achillea horanszkyi</u> Ujhelyi	<u>KPABG</u>

<u>Achillea ochroleuca</u> Ehrh.	besn, <u>IAGB</u> , kwha
<u>Achillea taygetea</u> Boiss. & Heldr.	ad, boch, chic, delf, <u>LI</u> , npnz, teg, ubc, ups
<u>Antennaria nordhageniana</u> Rune & Ronning	<u>UPS</u>
<u>Anthemis sancti-johannis</u> Turrill	ad, dbn, <u>K</u> , sta, wsy
<u>Artemisia atrata</u> Lam.	ad, besn, boch, kiel, kpabg, lau, mb, tur, u, ubc
<u>Artemisia granatensis</u> Boiss.	<u>B</u>
<u>Artemisia laciniata</u> Willd.	<u>ALTA</u> , boch
<u>Artemisia molinieri</u> Quezel Barbero & Loisel	ad, <u>BRES</u> , <u>HYE</u> , mb
<u>Artemisia nitida</u> Bertol.	b, <u>LJU</u> , mb, u
<u>Artemisia norvegica</u> Fries	AD, <u>K</u> , <u>OULU</u>
<u>Artemisia pancicii</u> (Janka) Ronn.	<u>PRC</u> , wag
<u>Aster pyrenaeus</u> Desf. ex DC.	ad, bern, besn, boch, bord, <u>BRES</u> , CGG, <u>HYE</u> , k, kiel, lau, <u>NCY</u> , sta, str, wa
<u>Aster sibiricus</u> L.	ALTA, E, <u>K</u> , MTJB, OULU
<u>Bellis bernardii</u> Boiss. & Reuter	kiel, <u>NEU</u> , <u>U</u> , ups
<u>Berardia subacaulis</u> Vill.	<u>CGG</u> , <u>HYE</u> , <u>LAU</u> , mb, <u>NCY</u> , <u>NEU</u> , nij, <u>U</u>
<u>Calendula suffruticosa</u> Vahl subsp. <u>maritima</u> (Guss.) Meikle	chis, <u>K</u>
<u>Carlina diae</u> (Rech.f.) Meusel & Kastner	<u>HAL</u>
<u>Carlina sitiensis</u> Rech.f.	<u>HAL</u>
<u>Centaurea balearica</u> J.D.Rodriguez	<u>BRES</u> , <u>HYE</u>
<u>Centaurea clementei</u> Boiss. ex DC.	b, <u>RNG</u>
<u>Centaurea corymbosa</u> Pourret	<u>BRES</u>
<u>Centaurea exarata</u> Boiss. ex Coss.	<u>MA</u>

<u>Centaurea haenseleri</u> (Boiss.) Boiss.	<u>MA</u>
<u>Centaurea huljakii</u> Wagner	mb
<u>Centaurea jankae</u> Brandza	<u>CGG</u>
<u>Centaurea kernerana</u> Janka	ngoet
<u>Centaurea lainzii</u> Fernandez Casas	<u>MA</u>
<u>Centaurea marschalliana</u> Sprengel	chis, <u>KWHA</u> , vor
<u>Centaurea procumbens</u> Balb.	ad, mb
<u>Centaurea ruthenica</u> Lam.	ad, b, besn, boch, <u>CGG</u> , gent, <u>GORK</u> , kiel, <u>kwha</u> , <u>LE</u> , msk, rv, <u>TASH</u> , vor
<u>Centaurea sadlerana</u> Janka	mb, ngoet
<u>Centaurea tauromenitana</u> Guss.	mb
<u>Doronicum cataractarum</u> Widder	<u>KPABG</u> , ncy, ups
<u>Erigeron major</u> (Boiss.) Vierh.	<u>B</u> , <u>LAU</u>
<u>Inula helvetica</u> Weber	<u>NEU</u>
<u>Kleinia mandraliscae</u> Tineo	e, K, mb+
<u>Lamyropsis carpini</u> Greuter	mb
<u>Leontodon boryi</u> Boiss. ex DC.	<u>B</u> , <u>MA</u>
<u>Leontodon microcephalus</u> (Boiss. ex DC.) Boiss.	mb
<u>Leucanthemum corsicum</u> (Less.) DC.	<u>HYE</u>
<u>Leuzea rhaponticoides</u> Graells	<u>B</u> , riga
<u>Ligularia glauca</u> (L.) O.Hoffman	<u>IAGB</u> , ngoet, <u>PRC</u> , str
<u>Ligularia sibirica</u> (L.) Cass.	AD, alta, b+, <u>BERN</u> , BR, E, <u>K</u> , <u>MB</u> +, <u>NCY</u> , <u>NEU</u> +, <u>NGOET</u> , <u>OULU</u> , tur, <u>WAG</u>
<u>Nananthea perpusilla</u> (Loisel.) DC.	<u>HYE</u>
<u>Palaeocyanus crassifolius</u> (Bertol.) Dostal	<u>CGG</u>
<u>Phalacrocarpum hoffmannseggii</u> (G.Samp.) M.Lainz	<u>MA</u>

<u>Ptilostemon niveus</u> (C.Presl) Greuter	<u>HYE</u>
<u>Rothmaleria granatensis</u> (Boiss. ex DC.) Font Quer	<u>K</u>
<u>Santolina elegans</u> Boiss. ex DC.	<u>BRES</u> , <u>K</u>
<u>Santolina oblongifolia</u> Boiss.	<u>MA</u>
<u>Santolina viscosa</u> Lag.	<u>CGG</u> , <u>MA</u>
<u>Scorzonera doria</u> Degen & Baldacci	bak
<u>Senecio auricula</u> Borgeau ex Coss.	<u>MA</u>
<u>Senecio congestus</u> (R.Br.) DC.	HYE
<u>Serratula lycopifolia</u> (Vill.) A.Kerner	msk, rig, ups
<u>Staezelina fruticosa</u> (L.) L.	wsy
<u>Telekia speciosissima</u> (L.) Less.	b, berg, <u>LAU</u> , <u>NEU</u> , sta, teg, ups, <u>Z</u>

CONVOLVULACEAE

<u>Ipomoea stolonifera</u> (Cyr.) J.F.Gmelin	chis
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CRASSULACEAE

<u>Crassula aquatica</u> (L.) Schonl.	bres
<u>Jovibarba allionii</u> (Jordan & Fourr.) D.A.Webb	<u>BERN</u> , brist, <u>CGG</u> , E, <u>LAU</u> , mb, <u>NCY</u> , <u>NEU</u> , rng, rot
<u>Sedum pruinatum</u> Link ex Brot.	b, br, e, hal, k, lau, prc, <u>U</u>
<u>Sedum serpentini</u> Janchen	hal
<u>Sedum stefco</u> Stef.	<u>U</u>
<u>Sedum tymphaeum</u> Quezel & Contandr.	<u>B</u>
<u>Sempervivum ballsii</u> Wale	BID, br, <u>BRIST</u> , <u>CGG</u> , dbn, <u>E</u> , <u>NCY</u> , rot, sta, tres, ubc
<u>Sempervivum calcareum</u> Jordan	<u>BERN</u> , brist, <u>CGG</u> , E, latt, <u>LAU</u> , li, ma, <u>NCY</u> , <u>NEU</u> , rot, sta, str, tall, tres, tur, u, wsy
<u>Sempervivum ciliosum</u> Craib	ad, alta, b, <u>BESN</u> , br, <u>BRIST</u> , dbn, <u>E</u> , <u>K</u> , lau, <u>LI</u> , <u>LJU</u> , ma, <u>NCY</u> , <u>NEU</u> , rot, sta, str, tall, ubc, wsy

Sempervivum juvenii Strgar

LAU, NGOET, rot

Sempervivum kindingeri Adamovic

besn, BID, br, brist, dbn, e,
hal, k, lau, ma, ncy, sta, ubc,
ups

Sempervivum kosaninii Praeger

ad, BESN, BID, br, brist, CGG,
dbn, E, k, NCY, NEU, rot, tall,
u, ubc, ups

Sempervivum macedonicum Praeger

alta, BID, br, brist, CGG, E, k,
lau, LJU, NCY, NEU, tur, ubc,
wsy

Sempervivum octopodes Turrill

BID, br, brist, CGG, E, k, LAU,
LJU, ncy, NEU, rot,

Sempervivum pittonii Schott Nyman &
Kotschy

ad, B, BERN, BESN, BID, brist,
CGG, dbn, E, frt, hal, k, kl,
kpabg, LAU, LI, ma, mb, NCY, NEU,
ngoet,
prc, rig, rot, sta, str, tall,
tur, u, ubc, Z

Sempervivum thompsonianum Wale

BID, br, brist, CGG, dbn, neu,
sta,

CRUCIFERAE

Aethionema cordatum (Desf.) Boiss.

ad, lau

Aethionema thomasianum Gay

ALTA, BERN, lau, mb

Alyssum borzaeanum Nyar.

CGG, IAGB, lau, sta, ups

Alyssum heldreichii Hausskn.

mb

Alyssum markgrafii O.E.Schulz

ad, hal, tcd

Alyssum moellendorffianum Aschers. ex
Beck

bg, dbn, frt, kiel, LJU, rng, tall

Alyssum smolikanum Nyar.

mb

Alyssum tenium Halacsy

B

Alyssum wulfenianum Bernh.

ad, alta, b, boch, chic, E, kiel,
tall, UBC

Arabis cebennensis DC.

ad, bres, LAU, NCY

Arabis ferdinandi-coburgi Kellerer &
Sunderm.

ad, alta, b, boch, dbn, gb, hal,
kiel, le, li, riga, u, ubc, wsy, z

Arabis lusitanica Boiss.

CGG

<u>Arabis sadina</u> (G.Samp.) Cout.	<u>HYE</u>
<u>Aubrieta erubescens</u> Griseb.	boch, br, u, ubc
<u>Aubrieta thessala</u> Boissieu	lau
<u>Biscutella sclerocarpa</u> Revel	<u>HYE</u>
<u>Brassica balearica</u> Pers.	<u>B</u> , <u>CGG</u> , hal, <u>K</u>
<u>Brassica gravinae</u> Ten.	<u>CGG</u> , <u>MA</u> , <u>NEU</u>
<u>Brassica insularis</u> Moris	<u>HYE</u>
<u>Brassica macrocarpa</u> Guss.	<u>HYE</u>
<u>Brassica villosa</u> Biv.	<u>HYE</u>
<u>Braya linearis</u> Rouy	<u>K</u> , <u>LAU</u> , <u>OULU</u>
<u>Braya purpurascens</u> (R.Br.) Bunge	<u>K</u> , <u>TCD</u>
<u>Cochlearia polonica</u> Frohl.	<u>TCD</u>
<u>Coronopus navasii</u> Pau	<u>BRES</u>
<u>Crambe tataria</u> Sebeok	b, <u>BERN</u> , <u>DTSK</u> , hal, <u>IAGB</u> , <u>KARA</u> , kiel, kuib, kwha, <u>LI</u> , msk, <u>MW</u> , oulu, prc, rig, rv, <u>SBG</u> , sver, ufa, uman, ups, vor, wa
<u>Degenia velebitica</u> (Degen) Hayek	<u>CGG</u> , lau, <u>LJU</u> , <u>NGOET</u> , wag
<u>Diploxixis siettiana</u> Maire	<u>BRES</u>
<u>Draba bruniifolia</u> Steven	<u>AD</u> , <u>B</u> , <u>BERN</u> , <u>CGG+</u> , e, <u>K</u> , lau, <u>MB+</u> , neu+, <u>U+</u>
<u>Draba cinerea</u> Adams	mb, ups, yosh
<u>Draba crassifolia</u> Graham	<u>CGG</u> , sta
<u>Draba haynaldii</u> Stur	alta, b, hal, kiel, riga
<u>Draba loiseleurii</u> Boiss.	hal, <u>HYE</u> , kiel, sta, u
<u>Erysimum hungaricum</u> Zapal.	sta
<u>Erysimum pieninicum</u> (Zapal.) Pawl.	sta
<u>Hormathophylla cadevalliana</u> (Pau) T.R.Dudley	<u>NEU</u>

Hormathophylla pyrenaica (Lapeyr.)
Cullen & Dudley

B, BERN, BRES, CGG, HYE, k, kiel,
LAU, mb, NEU, wag

Hormathophylla reverchonii (D. & H.)
Cullen & Dudley

NEU

Hutera rupestris P.Porta

BRES

Iberis semperflorens L.

bmbg, CGG, gent, k, le, LIVC,
mb, msk, prc, tall, wsy

Ionopsidium acaule (Desf.) Reichenb.

b, br, CGG, frt, hal, HYE, k, le,
tall, u

Isatis athoa Boiss.

CGG

Matthiola odoratissima (M.Bieb.) R.Br.

boch, YALT

Moricandia foetida Bourg. ex Coss.

MA

Murbeckiella boryi (Boiss.) Rothm.

HYE, mb

Ptilotrichum macrocarpum (DC.) Boiss.

besn, boch, CGG, HYE, LAU, NCY,
NEU, z

Ptilotrichum purpureum (Lag. &
J.D.Rodriguez) Boiss.

B, K, lau, MB+

Rhynchosinapis wrightii (O.E.Schulz)
Dandy ex Clapham

BRIST, CGG, LDS, RNG, TCD

Schivereckia doerfleri (Wettst.)
Bornm.

b, CGG, dbn, e, kiel, lau, le,
str, u

Schivereckia podolica (Besser) Andrz.

b, besn, bres, brist, CGG, dbn, E,
frt, gb, hal, IAGB, kiel, KUIB,
KWHA, le, MHA, mw, str, svur, tu,
ups, VOR, z

Sisymbrium supinum L.

b, bres, UPS

Thlaspi bulbosum Spruner ex Boiss.

hal

Vella pseudocytisus L.

B, BERN, CGG, dbn, E, K, MA, tcd

CYPERACEAE

Carex baldensis L.

B, BERN, duss, ER, frt, gb, hal,
hbg, LAU, li, NEU, NGOET, rig, Z

Carex trinervis Degl. ex Loisel.

c

Eriophorum gracile Koch ex Roth

CGG, OULU

DATISCACEAE

Datisca cannabina L.

amd, athd, avu, b, besn, br,
brist, CGG, dbn, duss, E, HYE, k,
mosm, prc, str, TASH, tbi, u, wag

DIPSACACEAE

Cephalaria radiata Griseb. & Schenk

b, boch, CGG

Knautia basaltica Chass. & Szabo

bres, mb

Knautia godetii Reuter

BESN

Knautia sarajevensis (Beck) Szabo

LJU

Scabiosa cosmoides Boiss.

K

Scabiosa minoana (P.H.Davis) Greuter

K

Scabiosa turolensis Pau ex Willk.

b, MA

Succisella carvalhoana (Mariz) Baksay

HYE, ups

Succisella petteri (J.Kerner & Murb.)
Beck

CGG, gb, k

DROSERACEAE

Aldrovanda vesiculosa L.

k, Z

ELATINACEAE

Elatine alsinastrum L.

HYE

ERICACEAE

Erica sicula Guss.

CGG+

Rhododendron luteum Sweet

b, batu, bg, br, chic, dbn, E,
frt, fru, gb, gork, hal, K, kali,
KL, kwha, lau, lds, li, livc, LJU,
MESH, mha, msk, mw, npnz, prc,
riga, rng, ROT, such, tall, TASH,
tbi, tres, tur, ubc, ups, WA, wag,
wrsl, wsy, wtu

Vaccinium arctostaphylos L.

avu, b, batu, E, gb, k, mha, tall,
wag, wesb, wsy, wtu

EUPHORBIACEAE

Euphorbia duvalii Lecoq & Lamotte

K

Euphorbia gregerseii K.Maly ex Beck

boch, dbn, E

GENTIANACEAE

Centaurium chloodes (Brot.) G.Samp

bres, CGG, dbn, sta, u, wsy, z

Gentiana cruciata L. subsp.
phlogifolia (Schott & Kotschy)
Tutin

b, BERN, dbn, frt, kiel, lau, mb,
NCY, NEU, ubc

Gentiana dinarica Beck

BERN, boch, dbn, kiel, LAU, ncy,
NEU, sta, ubc, wsy, Z

Gentiana ligustica R. de Vilm. &
Chopinot

bres, E, G, LAU, NCY, NEU

Gentianella uliginosa (Willd.) Borner

C, UPS

GERANIACEAE

Erodium alpinum L'Herit.

HYE

Erodium boissieri Coss.

B, K

Erodium chrysanthum L'Herit. ex DC.

bg, cgg, dbn, k, lau, rng, sta,
ubc, wsy

Erodium guicciardii Heldr. ex Boiss.

K, lau

Erodium guttatum (Desf.) Willd.

bg, rng

Erodium rodiei (Braun-Blanquet)
Poirion

bres, LAU, TCD, wsy

Erodium rupicola Boiss.

MA

Erodium sanguis-christi Sennen

ad, tcd, ups

Erodium sibthorpium Boiss.

dbn, lau

Geranium cataractarum Coss.

CGG, K, LAU, u

Geranium cazorlense Heywood

LAU

GESNERIACEAE

Jankaea heldreichii (Boiss.) Boiss.

bern, E, GB, lau, NEU, z

Ramonda nathaliae Pancic & Petrovic

b, BERN, CGG, dbn, E, GB, HAL, K, kiel, LAU, le, LJU, mb, NCY, NEU, sta, tcd, u, ups, wsy, z

Ramonda serbica Pancic

b, BERN, CGG, dbn, E, GB, k, kiel, LAU, LJU, mb, NEU, sta, tall, TCD, U, ubc, ups, wsy, z

GRAMINEAE

Bromus bromoideus (Lej.) Crepin

b, bres

Bromus grossus Desf. ex DC.

br, bres

Bromus interruptus (Hackel) Druce

bres, CGG, tcd

Cenchrus ciliaris L.

HK, HYE

Cornucopiae cucullatum L.

CGG

Corynephorus macrantherus Boiss. & Reuter

HYE

Deschampsia setacea (Huds.) Hackel

duss, HYE

Festuca clementei Boiss.

B

Festuca pseudeskia Boiss.

B+

Poa flaccidula Boiss. & Reuter

HYE

Saccharum spontaneum L.

HK, mb

Stipa dasyphylla (Lindem.) Trautv.

DTSK, hal, MW, NOVB, PRC, SBG

Stipa ucrainica P.Smirnow

b, boch, dtsk, li, sbg, vor

Stipa zalesskii Wilensky

boch, DTSK, KARA, khar, NOVB, SBG, tash

HYDRANGEACEAE

Philadelphus coronarius L.

bak, besn, bgaas, CGG, chic, dbn, delf, DHM, E, hal, k, kali, lisjc, ma, msk, mw, nij, ort, prc, riga, rv, tall, tbi, tur, u, ups, wi, wtu

HYPERICACEAE

Hypericum athoum Boiss. & Orph.

CGG, TCD

Hypericum canadense L.

TCD

Hypericum delphicum Boiss. & Heldr.

boch, k, sta, tur, wsy

Hypericum fragile Heldr. & Sart. ex Boiss.

dbn, k, lau, mb, palz, sta

Hypericum hircinum L. subsp.
cambessedesii (Mares & Vigineix)
Sauvage

CGG

Hypericum kelleri Baldacci

wag

IRIDACEAE

Crocus etruscus Parl.

ad, bg, CGG, K, u, ups, wsy

Crocus goulimyi Turrill

alta, amd, athu, bg, cgg, E, gb,
k, rng, sta, U, ubc, wsy, z

Crocus imperati Ten.

ad, alta, bg, br, CGG, dbn, E, K,
li, sta, ubc, ups, wsy

Crocus olivieri Gay subsp. balansae
(Gay ex Baker) Mathew

WSY, wtu

Crocus oreocreticus B.L.Burt

wsy

Crocus robertianus C.D.Brickell

wsy

Iris humilis Georgi

b, chis, frt, hal, kiel, MA, tall,
ups

Iris marsica Ricci & Colasante

K

Iris serotina Willk.

K

Iris sintenisii Janka subsp. brandzae
(Prodan) Webb

IAGB, ncy

Romulea tempskyana Freyn

CGG, K

LABIATAE

Ballota frutescens (L.) Woods

dbn, e, k, LAU, U

Dracocephalum austriacum L.

BERN, LAU, LI, msk, ncy, NEU, PRC,
sta, str, ups

Marrubium friwaldskyanum Boiss.

kiel, NCY, str

Micromeria taygetea P.H.Davis

GB

<u>Moluccella spinosa</u> L.	b, HYE
<u>Nepeta camphorata</u> Boiss. & Heldr.	ad, elsl, kpabg, nsm
<u>Nepeta heldreichii</u> Halacsy	<u>BERN</u>
<u>Origanum calcaratum</u> Juss.	<u>K</u> , wsy
<u>Origanum dictamnus</u> L.	<u>E</u> , ELSL, K, wsy
<u>Origanum scabrum</u> Boiss. & Heldr.	E, mb
<u>Salvia blancoana</u> Webb & Heldr.	<u>K</u>
<u>Salvia candelabrum</u> Boiss.	dbn, frt, <u>K</u> , latt, str
<u>Salvia jurisicii</u> Kosanin	amd, b, bmbg, E, hal, k, kaun, kiel, lau, li, msk, riga, sta, teg, ups, wa
<u>Salvia scabiosifolia</u> Lam.	kwha, msk, str, <u>YALT</u>
<u>Salvia transsylvanica</u> (Schur ex Griseb.) Schur	nij, tur
<u>Satureja rumelica</u> Velen.	b, li
<u>Scutellaria balearica</u> Barc.	<u>CGG</u> , <u>K</u>
<u>Sideritis perfoliata</u> L.	<u>HYE</u>
<u>Stachys candida</u> Bory & Chaubard	CGG, wsy
<u>Stachys chrysantha</u> Boiss. & Heldr.	bak
<u>Teucrium arduini</u> L.	ad, <u>BERN</u> , CGG, delf, lau, <u>LJU</u> , u
<u>Teucrium aroanium</u> Orph. ex Boiss.	k, sta
<u>Teucrium cuneifolium</u> Sibth. & Smith	hal
<u>Teucrium halacsyanum</u> Heldr.	hal
<u>Teucrium salviastrum</u> Schreber	<u>CGG</u>
<u>Teucrium turredanum</u> Losa & Rivas Goday	<u>MA</u>
<u>Thymus camphoratus</u> Hoffmanns. & Link	bres, chic, <u>K</u> , ubc
<u>Thymus capitellatus</u> Hoffmanns. & Link	E
<u>Thymus carnosus</u> Boiss.	<u>CGG</u> , dbn, k, <u>MA</u>

<u>Thymus cephalotos</u> L.	<u>K</u>
<u>Thymus nitens</u> Lamotte	HYE, str
<u>Thymus richardii</u> Pers.	boch

LEGUMINOSAE

<u>Anthyllis henoniana</u> Coss. ex Battand.	HYE
<u>Argyrolobium biebersteinii</u> P.W.Ball	<u>UBC</u>
<u>Astragalus aquilanus</u> Anzalone	alta
<u>Astragalus arenarius</u> L.	tu, <u>UPS</u>
<u>Astragalus centralpinus</u> Braun-Blanquet	ad, <u>ALTA</u> , boch, HYE, kiel, <u>LAU</u> , mb, msk, ncy
<u>Astragalus dasyanthus</u> Pallas	<u>IAGB</u> , kwha, mosm, msk
<u>Astragalus peterfii</u> S.Javorka	<u>BERN</u> , msk
<u>Astragalus roemerii</u> Simonkai	bern, bres, <u>LAU</u> , msk
<u>Astragalus sulcatus</u> L.	E, K
<u>Colutea insularis</u> Browicz	bgaas
<u>Cytisus aeolicus</u> Guss. ex Lindl.	<u>NEU</u>
<u>Cytisus ardoini</u> Fourn.	bhbg, cgg, dbn, e, k, <u>NEU</u> , sta, ubc
<u>Cytisus emeriflorus</u> Reichenb.	<u>BERN</u> , duss, E, <u>LAU</u> , <u>NCY</u> , <u>NEU</u> , riga, sta, u, <u>Z</u>
<u>Genista dorycnifolia</u> Font Quer	<u>BRES</u>
<u>Genista holopetala</u> (Fleischm. ex Koch) Baldacci	<u>LJU</u>
<u>Genista ramosissima</u> (Desf.) Poiret	rv
<u>Hedysarum boutignyanum</u> Alleiz.	<u>LAU</u>
<u>Hedysarum tauricum</u> Pallas ex Willd.	<u>YALT</u>
<u>Lathyrus neurolobus</u> Boiss. & Heldr.	bres
<u>Lathyrus transsilvanicus</u> (Sprengel) Fritsch	amd

<u>Ononis saxicola</u> Boiss. & Reuter	<u>MA</u>
<u>Trifolium lupinaster</u> L.	<u>MB+</u>
<u>Vicia argentea</u> Lapeyr.	bres

LENTIBULARIACEAE

<u>Pinguicula vallisneriifolia</u> Webb	<u>GB, K, LAU</u>
<u>Utricularia subulata</u> L.	<u>K</u>

LILIACEAE

<u>Allium grosii</u> Font Quer	<u>K</u>
<u>Allium heldreichii</u> Boiss.	E, <u>GB, K, LAU</u> , mb, ups, wsy
<u>Allium insubricum</u> Boiss. & Reuter	hal, <u>LAU</u> , li, ncy, <u>NEU</u> , ups
<u>Allium junceum</u> Sibth. & Smith	<u>K, U+</u>
<u>Allium kermesinum</u> Reichenb.	li, lju
<u>Allium macedonicum</u> Zahar.	le
<u>Allium obliquum</u> L.	alta, b, CGG, <u>IAGB</u> , k, kpabg, le, mw, <u>NOVB</u> , str, tall, ups
<u>Allium olympicum</u> Boiss.	<u>K</u>
<u>Allium parnassicum</u> (Boiss.) Halacsy	<u>GB</u>
<u>Allium suaveolens</u> Jacq.	frt, <u>GB, KPABG</u> , li, <u>NCY, STR</u>
<u>Androcymbium rechingeri</u> Greuter	le
<u>Bellevalia sarmatica</u> (Pallas) Woronow	br, chis, gb, hal, <u>IAGB</u> , kwha, <u>LE</u> , <u>MHA</u> , rv, <u>SBG, TALL</u> , tash, vor, <u>YALT, Z</u>
<u>Colchicum arenarium</u> Waldst. & Kit.	k, wsy
<u>Colchicum corsicum</u> Baker	<u>GB</u> , wsy
<u>Colchicum fominii</u> Bordz.	bak, <u>CHIS, DTSK, MW</u>
<u>Colchicum macedonicum</u> Kosanin	CGG
<u>Colchicum stevenii</u> Kunth	E, <u>K</u>
<u>Fritillaria carica</u> Rix	<u>BOCH, CGG, K</u>

<u>Fritillaria conica</u> Boiss.	<u>CGG</u> , <u>E</u> , <u>GB</u> , <u>k</u>
<u>Fritillaria davisii</u> Turrill	<u>CGG</u> , <u>GB</u> , <u>k</u> , <u>wsy</u>
<u>Fritillaria drenovskii</u> Degen & Stoy.	<u>arkh</u> , <u>CGG</u> , <u>E</u> , <u>gb</u> , <u>k</u> , <u>u</u>
<u>Fritillaria elwesii</u> Boiss.	<u>CGG+</u> , <u>E</u> , <u>HLU</u> , <u>K</u> , <u>lau</u> , <u>U</u>
<u>Fritillaria epirotica</u> Turrill ex Rix	<u>GB</u>
<u>Fritillaria gussichiae</u> (Degen & Doerfler) Rix	<u>u</u>
<u>Fritillaria involucrata</u> All.	<u>ad</u> , <u>arkh</u> , <u>b</u> , <u>CGG</u> , <u>E</u> , <u>gb</u> , <u>GOET</u> , <u>k</u> , <u>LAU</u> , <u>u</u> , <u>wsy</u>
<u>Fritillaria meleagroides</u> Patrin ex Schult. & Schult. f.	<u>DZHB</u> , <u>E</u> , <u>KALI</u> , <u>KWHA</u> , <u>MHA</u> , <u>rig</u> , <u>TALL</u> , <u>uu</u> , <u>vor</u>
<u>Fritillaria obliqua</u> Ker-Gawl.	<u>CGG</u> , <u>E</u> , <u>GB</u> , <u>k</u> , <u>wsy</u>
<u>Fritillaria pinardii</u> Boiss.	<u>BOCH</u> , <u>CGG</u> , <u>K</u>
<u>Fritillaria pineticola</u> O.Schwarz	<u>E</u> , <u>MTJB</u>
<u>Fritillaria rhodia</u> Hansen	<u>GB</u>
<u>Fritillaria rhodocanakis</u> Orph. ex Baker	<u>CGG</u> , <u>wsy</u>
<u>Fritillaria sibirnyi</u> Velen.	<u>GB</u>
<u>Fritillaria tuntasia</u> Heldr. ex Halacsy	<u>CGG</u> , <u>E</u> , <u>gb</u> , <u>K</u> , <u>ubc</u> , <u>wsy</u>
<u>Gagea taurica</u> Steven	<u>BAK</u> , <u>IAGB</u> , <u>le</u>
<u>Hyacinthella atchleyi</u> (A.K.Jackson et al) Feinbrun	<u>GB</u> , <u>K</u> , <u>le</u>
<u>Hyacinthella dalmatica</u> (Baker) Chouard	<u>gb</u> , <u>K</u> , <u>lds</u> , <u>wsy</u>
<u>Lilium pomponium</u> L.	<u>bern</u> , <u>br</u> , <u>E</u> , <u>k</u> , <u>LAU</u> , <u>le</u> , <u>ncy</u> , <u>U</u> , <u>wsy</u>
<u>Lilium rhodopaeum</u> Delip.	<u>k</u> , <u>le</u> , <u>u</u>
<u>Muscari gussonei</u> (Parl.) Tod.	<u>CGG</u>
<u>Muscari macrocarpum</u> Sweet	<u>bg</u> , <u>CGG</u> , <u>E</u> , <u>GB</u> , <u>K</u> , <u>ups</u> , <u>wsy</u>
<u>Ornithogalum amphibolum</u> Zahar.	<u>K</u>

<u>Scilla cupanii</u> Guss.	CGG, ups
<u>Scilla hughii</u> Tineo ex Guss.	wsy
<u>Scilla litardierei</u> Breistr.	<u>RNG</u>
<u>Scilla messeniaca</u> Boiss.	AD, <u>CGG+</u> , E, <u>K</u> , wsy+
<u>Scilla odorata</u> Link	<u>K</u>
<u>Tulipa doerfleri</u> Gandoger	wsy
<u>Tulipa goulimyi</u> Sealy & Turrill	<u>B</u>
<u>Tulipa undulatifolia</u> Boiss.	<u>GB</u> , <u>K</u> , U
<u>Tulipa urumoffii</u> Hayek	AD, BR, lau

LINACEAE

<u>Linum dolomiticum</u> Borbas	boch, bpu, kiel, lau, <u>LI</u> , sta, ups
<u>Linum leonii</u> F.W.Schultz	hal, kiel

LORANTHACEAE

<u>Viscum cruciatum</u> Sieber ex Boiss.	<u>BERN</u> , <u>MA</u>
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MALVACEAE

<u>Hibiscus palustris</u> L.	<u>BRES</u> , <u>HYE</u> , palz, str, ubc
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NYMPHAEACEAE

<u>Nymphaea lotus</u> L.	besn, br, bres, CGG, E, gent, <u>IAGB</u> , <u>K</u> , mb, prc, tash, z
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OLEACEAE

<u>Forsythia europaea</u> Degen & Baldacci	avu, b, bak, besn, bgaas, br, bres, cgg, dbn, E, frt, fru, gb, gent, k, kali, <u>LAU</u> , le, mha, <u>MSK</u> , neu, rig, <u>ROT</u> , rv, sta, str, tall, tbi, trh, u, wa, wag, yalt, <u>Z</u>
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ORCHIDACEAE

<u>Calypso bulbosa</u> (L.) Oakes	<u>KPABG</u> , mb, <u>SASY</u> , <u>SVER</u> , <u>UBC</u>
<u>Comperia comperiana</u> (Steven) Aschers. & Graebner	<u>K</u>

Cypripedium calceolus L.

avu, b, besn, BG, c, CGG, CHIS,
dr, E, er, frt, g, GB, GORK, hal,
hbg, IAGB, K, kali, KL, KPABG,
kwha, LAU, LDS, LE, LECB, LI,
livu, LJU, MHA, MSK, MW, NCY, neu,
NGOET, OMSK, OULU, PRC, RIG,
SASY, SVER, tu, tur, ubc, UPS,
USSU, wag, WI, z

Hammarbya paludosa (L.) Kuntze

kali, UBC

Liparis loeselii (L.) Rich.

C, CGG, K, KIEL, KL

Ophrys argolica Fleischm.

K

Ophrys reinholdii Spruner ex Fleischm.

BOCH, K

Ophrys sphegodes Mill. subsp. helenae
(Renz) D.M.Moore

K

Platanthera obtusata (Pursh) Lindl.

UBC

Spiranthes romanzoffiana Cham.

UBC

PAEONIACEAE

Paeonia cambessedesii (Willk.) Willk.

b, boch, brist, CGG, k, kiel,
LIVC, tall, ubc, wsy, wtu

Paeonia clusii Stern subsp. rhodia
(Stearn) Tzanoudakis

E, wsy

PALMAE

Phoenix theophrasti Greuter

ATHD, AVU, B, BERN, BRES, BRISS,
CGG, HYE, K, livc, RNG, SDZO, tres

PAPAVERACEAE

Corydalis rutifolia (Sibth. & Smith)
DC.

dbn

Papaver cor-sancti-stephani Zapal.

bg, kiel, latt, ups

Papaver laestadianum (Nordh.) Nordh.

UPS

Papaver lapponicum (Tolm.) Nordh.

LAU, OULU

Papaver rupifragum Boiss. & Reuter

br, E, K, MA

Rupicapnos africana (Lam.) Pomel

GB, MA, sta

Sarcocapnos integrifolia (Boiss.)
Cuatrec.

MA

PLANTAGINACEAE

Plantago reniformis Beck

besn, ups

Plantago schwarzenbergiana Schur.

MB+

PLUMBAGINACEAE

Armeria colorata Pau

MA

Armeria humilis (Link) J.A.Schultes

boch

Armeria pseudarmeria (Murray) Mansf.

ad, br, CGG, dbn, fru, kiel, sta,
tall, tres, wi

Armeria rouyana Daveau

boch

Armeria soleirolii (Duby) Godron

HYE, mb

Armeria vandasii Hayek

le

Armeria welwitschii Boiss.

ad, boch, bres, CGG, dbn, GENT,
hal, HYE, nij

Limonium album (Coincy) Sennen

MA

Limonium companyonis (Gren. & Billot)
Kuntze

CGG

Limonium cosyrense (Guss.) Kuntze

dbn, k, sta

Limonium paradoxum Pugsley

BRIST, TCD

Limonium transwallianum (Pugsley)
Pugsley

CGG, STA, TCD, U

POLEMONIACEAE

Polemonium boreale Adams

dbn, KPABG, livc, mw, UBC, UPS

POLYGALACEAE

Polygala vayredae Costa

b, bern, E, gb, kiel, lau, li,
neu, rot, sta, ubc

POLYGONACEAE

Rheum rhaponticum L.

amd, b, br, hlu, k, lau, mw, prc,
ups, wi

Rumex rupestris Le Gall

BRIST, CGG, str

Rumex vesicarius L.

ups

PRIMULACEAE

Androsace brevis (Hegetschw.) Ces.

BERN, E, LAU

Androsace chaixii Gren. & Godron

kiel, lau, sta

Androsace ciliata DC.

E, harr, kiel, NCY, sta, ubc, wsy

Androsace cylindrica DC.

CGG, E, harr, k, sta, wsy, z

Androsace mathildae Levier

E, hal, LAU, ncy, NEU, sta, u, ubc, z

Androsace pyrenaica Lam.

CGG, E, harr, k, wsy

Coris hispanica Lange

MA

Cyclamen rhodium R.Gorer

WSY

Lysimachia minoricensis J.D.Rodriguez

b, bres, CGG, HYE, mb, ups, wag, wsy

Primula allionii Loisel.

BERN, CGG, E, G, harr, LAU, mb, NEU, sta, ubc, wsy

Primula carniolica Jacq.

ad, b, br, E, kiel, LAU, li, LJU, mb, NCY, NGOET, ups

Primula frondosa Janka

ad, b, bg, boch, CGG, dbn, DHM, frt, fru, harr, kiel, lau, li, sta, tcd, trh, ubc, wi, wsy

Primula glaucescens Moretti

alta, b, berg, BERN, boch, CGG, duss, E, GENT, K, LAU, mb, NCY, NEU, rig, sta, tall, U, ups, wsy

Primula kitaibeliana Schott

LJU, NCY, ubc

Primula palinuri Petagna

ad, b, bres, CGG, duss, E, K, kiel, mb, u, wsy, Z

Primula spectabilis Tratt.

b, boch, DUSS, E, GB, GENT, kiel, LAU, mb, NCY, sta, u, ubc, wsy

Primula vulgaris Huds. subsp.
balearica (Willk.) W.W.Smith &
Forrest

BRES, CGG, fru, K

<u>Primula wulfeniana</u> Schott subsp. <u>baumgarteniana</u> (Degen & Moesz) Ludi	boch
<u>Soldanella pindicola</u> Hausskn.	b, <u>BRES</u> , <u>DUSS</u> , E, sta, tim, u, ubc
<u>Soldanella villosa</u> Darracq	E, harr, lau, wsy
RANUNCULACEAE	
<u>Aconitum angustifolium</u> Bernh.	<u>LI</u> , <u>LJU</u>
<u>Aconitum corsicum</u> Gayer	<u>MB+</u>
<u>Adonis distorta</u> Ten.	<u>LAU</u>
<u>Aquilegia alpina</u> L.	ad, bern, bhhg, br, dbn, E, ELSL, fru, harr, <u>K</u> , kiel, <u>LAU</u> , <u>LI</u> , mb, <u>NCY</u> , <u>NIJ</u> , oulu, sta, tall, ubc, ups, <u>Z</u>
<u>Aquilegia amaliae</u> Heldr. ex Boiss.	<u>ATHD</u> , boch, <u>LI</u>
<u>Aquilegia bernardii</u> Gren. & Godron	harr, kiel, lau, <u>NCY</u>
<u>Aquilegia bertolonii</u> Schott	ad, <u>CGG</u> , DHM, harr, k, kiel, npsz, sta, tall, ubc, wsy, z
<u>Aquilegia cazorlensis</u> Heywood	<u>LAU</u> , mb
<u>Aquilegia grata</u> F.Maly ex Zimmerer	<u>LJU</u>
<u>Aquilegia kitaibelii</u> Schott	kiel, kpabg, <u>LJU</u>
<u>Aquilegia litardierei</u> Briq.	<u>NEU</u>
<u>Aquilegia ottonis</u> Orph. ex Boiss.	ad, <u>CGG</u> , <u>GB</u> , mb
<u>Aquilegia thalictrifolia</u> Schott & Kotschy	ad, b, k, <u>LAU</u> , <u>NCY</u> , <u>NEU</u> , <u>RNG</u> , <u>Z</u>
<u>Callianthemum kernerianum</u> Freyn ex A.Kerner	boch, <u>DUSS</u> , <u>NGOET</u> , z
<u>Delphinium requienii</u> DC.	ad, blan, bord, <u>BRES</u> , cgg, <u>HYE</u> , k, <u>NIJ</u>
<u>Garidella nigellastrum</u> L.	AD, K
<u>Helleborus lividus</u> Aiton	ad, amd, <u>CGG</u> , E, <u>K</u> , neu, teg, u, wsy, z
<u>Helleborus orientalis</u> Lam.	ad, b, bhhg, br, <u>CGG</u> , dbn, <u>E</u> , <u>FRT</u> , harr, <u>K</u> , li, npnz, u, wag, wsy

Pulsatilla halleri (All.) Willd.
subsp. styriaca (Pritzel) Kamels

Pulsatilla hungarica Soo

Pulsatilla patens (L.) Miller

Ranunculus bilobus Bertol.

Ranunculus creticus L.

Ranunculus ficarioides Bory & Chaubard

Ranunculus polyphyllus Waldst. & Kit.
ex Willd.

Ranunculus revelieri Bor.

Ranunculus sulphureus Phipps

Ranunculus wettsteinii Doerfler

Ranunculus weyeri Mares

Thalictrum calabricum Sprengel

Thalictrum orientale Boiss.

bern, boch, E, lau, le, mb, STA,
str, tur, u, ubc, UPS, wsy

boch, harr, lau

ARKH, boch, chic, frt, gb, GORK,
hal, irvc, K, KALI, KARA, LAU, LI,
mw, NGOËT, oulu, PRC, RNG, SARAT,
str, TALL, tash, TK, TUR, u, UBC,
UPS, vor, wa, WI, wsy

e, LAU, LI

E, gb, K, wsy

CGG

gork, VOR

HYE

hal, KPABG

gb

BRES, CGG, wsy

boch, E, kpabg, nij

boch, E

RESEDACEAE

Reseda complicata Bory

Reseda gredensis (Cutanda & Willk.)
Muell. Arg.

Reseda jacquinii Reichenb.

B, br, frt, livc, ma, NCY, NIJ, u,
ups

b, MA

HYE

RHAMNACEAE

Rhamnus intermedius Steudel & Hochst.

b

ROSACEAE

Cotoneaster nummularia Fischer & C.A.
Meyer

b, bgaas, fru, hal, riga, rv, str,
tbi

Geum heterocarpum Boiss.

boch, BRES, HYE, NCY, u

Malus florentina (Zuccagni)
C.K.Schneider

e, gb, k, kwha, u, wag, wtu

Malus trilobata (Labill.)
C.K.Schneider

bak, k, latt, rot, ups, wag, wesb

Potentilla carniolica A.Kerner

LJU

Potentilla delphinensis Gren. & Godron

ad, BERN, besn, hal, NCY, ups

Potentilla grammopetala Moretti

ad, BERN, nij

Potentilla hyparctica Malte

MB+, OULU, U+

Potentilla multifida L.

alta, bern, besn, frt, hal, k,
KPABG, nij, oulu, prc, str, ubc,
UPS

Potentilla visianii Pancic

boch, ubc

Prunus ramburii Boiss.

HYE

Sanguisorba dodecandra Moretti

b, berg, boch, e, hal, LAU, NEU

Sibbaldia parviflora Willd.

boch, kpabg

Sibiraea altaiensis (Laxm.)
C.K.Schneider

b, gb, gork, k, kiev, kwha, LAU,
le, LJU, MESH, mha, msk, mw, novb,
riga, rng, sbg, sta, str, tall,
tros, U, ups, wag

Spiraea cana Waldst. & Kit.

amd, ups

Spiraea crenata L.

bgaas, br, fru, gork, K, kali,
kwha, MESH, MHA, msk, mw, palz,
riga, rv, sbg, tall, TBI, tros,
vor, wa

RUBIACEAE

Asperula gussonii Boiss.

alta, besn, CGG, chic, dbn, lau

Asperula hercegovina Degen

dbn

Asperula hexaphylla All.

k, kiel, LAU

Asperula suberosa Sibth. & Smith

E, k, MB, UBC+

Galium fleurotii Jordan

BRIST, CGG

Galium viridiflorum Boiss. & Reuter

MA

SALICACEAE

Salix bicolor Willd.

E, LAU, NCY

SAXIFRAGACEAE

Saxifraga arachnoidea Sternb.

B

Saxifraga berica (Beguinot) D.A.Webb

CGG, K

Saxifraga biternata Boiss.

CGG, K, TCD

Saxifraga cebennensis Rouy & Camus

BERN, besn, CGG, E, k, LAU, mb, NCY, NEU, sta, TCD

Saxifraga cochlearis Reichenb.

ad, alta, b, bern, CGG, dbn, DHM, E, G, K, LAU, le, li, mb, NCY, NEU, RNG, sta, tall, TCD, u, ubc, wsy, z

Saxifraga conifera Coss. & Durieu

b, boch, gb, K, LAU, le, NEU, sta, tall, z

Saxifraga diapensioides Bellardi

BERN, CGG, GB, kiel, LAU, mb, NEU, sta, TCD, Z

Saxifraga florulenta Moretti

CGG, NEU

Saxifraga hartii D.A.Webb

bres, CGG, dbn, K, TCD, wsy

Saxifraga latepetiolata Willk.

CGG, lau, mb

Saxifraga moncayensis D.A.Webb

b, CGG, K, ncy, TCD

Saxifraga mutata L. subsp. demissa
(Schott & Kotschy) D.A.Webb

mb

Saxifraga nervosa Lapeyr.

B, CGG, ncy, TCD

Saxifraga nevadensis Boiss.

MA, mb, sta, Z

Saxifraga oppositifolia L. subsp.
amphibia (Sunderm.) Braun-Blanquet

le

Saxifraga presolanensis Engl.

berg

Saxifraga reuterana Boiss.

CGG, K, TCD

Saxifraga tombeanensis Boiss. ex Engl.

bern, CGG, E, lau, TCD, ubc

Saxifraga valdensis DC.

E, G, hal, LAU, NCY, NEU, tall, Z

<u>Saxifraga vandellii</u> Sternb.	<u>BERN</u> , dbn, <u>LAU</u> , <u>NEU</u> , tcd
<u>Saxifraga vayredana</u> Luizet	<u>B</u> , <u>CGG</u> , hal, <u>K</u> , mb, <u>TCD</u> , u
<u>Saxifraga wahlenbergii</u> Ball	<u>U</u>

SCROPHULARIACEAE

<u>Antirrhinum grosii</u> Font Quer	gb
<u>Antirrhinum pulverulentum</u> Lazaro	<u>MA</u>
<u>Cymbalaria aequitriloba</u> (Viv.) A.Chev. subsp. <u>fragilis</u> (J.D.Rodriguez) D.A.Webb	<u>BRES</u>
<u>Digitalis dubia</u> J.D.Rodriguez	amd, <u>CGG</u> , hal, <u>HYE</u> , <u>K</u> , kiel, nij
<u>Linaria amoi</u> Campo ex Amo	<u>K</u>
<u>Linaria arenaria</u> DC.	<u>HYE</u> , <u>K</u> , <u>MA</u>
<u>Linaria faucicola</u> Leresche & Levier	k
<u>Linaria flava</u> (Poiret) Desf.	<u>HYE</u>
<u>Lindernia procumbens</u> (Krocker) Philcox	<u>HK</u> , k
<u>Scrophularia arguta</u> Aiton	<u>HYE</u>
<u>Verbascum acaule</u> (Bory & Chaubard) Kuntze	mb
<u>Verbascum laciniatum</u> (Poiret) Kuntze	<u>MA</u>
<u>Verbascum lagurus</u> Fischer & C.A.Meyer	boch
<u>Verbascum spathulisepalum</u> Greuter & Rech.f.	<u>B</u>
<u>Veronica rhodopaea</u> (Velen.) Degen ex Stoy. et al	boch
<u>Veronica rosea</u> Desf.	lau
<u>Veronica turrilliana</u> Stoy. & Stef.	dbn, k, kiel, str, u
<u>Wulfenia baldaccii</u> Degen	amd, b, bg, boch, brist, <u>CGG</u> , dbn, E, gb, hal, kiel, lau, le, mb, ncy, tall, u, ubc, wag

SELAGINACEAE

Globularia cambessedesii Willk.

CGG

Globularia incanescens Viv.

bg, boch, K, kiel, LAU, le, li,
NEU, ubc

SOLANACEAE

Mandragora officinarum L.

amd, b, bern, besn, bg, br, brist,
CGG, delf, E, elsl, frt, gb, hal,
hlu, K, kiel, lau, MA, neu, STA,
str, teg, u, ubc, ups, wa, wsy

THYMELAEACEAE

Daphne arbuscula Celak.

alta, b, bern, CGG, e, harr, k,
kiel, lau, li, NEU, PRC, tcd, ubc,
wsy

Daphne jasminea Sibth. & Smith

CGG, wsy

Daphne petraea Leybold

B, bres, kiel, LAU, NEU, ubc, wsy

Daphne rodriguezii Texidor

K

TRAPACEAE

Trapa natans L.

amd, athd, avu, b, BESN, DR, er,
g, gb, hal, KALI, kiel, KL, kwha,
LAU, mb, MW, NCY, neu, nsm, OMSK,
TASH, teg, ups, WRS, Z

TYPHACEAE

Typha minima Funk

ad, b, brist, CGG, dbn, er, fb,
frt, g, HYE, k, kiel, lau, li, mb,
ncy, PRC, rng, STA, ubc, Z

Typha shuttleworthii Koch & Sonder

b, dbn, hye, kiel, str, ups, Z

ULMACEAE

Celtis caucasica Willd.

bak, bgaas, fru, K, kali, kbai,
kwha, LAU, ma, MESH, msk, neu,
riga, sbg, TBI, tros, u, wesb,
WTU, yalt

Zelkova cretica (Smith) Spach

dbn, palz, RNG, wesb, wsy, wtu

UMBELLIFERAE

<u>Angelica heterocarpa</u> Lloyd	<u>BORD</u>
<u>Angelica pachycarpa</u> Lange	<u>CGG, K, MA</u>
<u>Angelica palustris</u> (Besser) Hoffman	<u>FRT</u> , hal
<u>Apium repens</u> (Jacq.) Lag.	avu, b, c, <u>CGG, K</u>
<u>Astrantia pauciflora</u> Bertol.	lau
<u>Bupleurum barceloi</u> Coss. ex Willk.	<u>CGG, K</u>
<u>Eryngium alpinum</u> L.	b, bern, <u>BESN</u> , brist, <u>CGG</u> , dbn, duss, E, elsl, g, gb, gbg, hlu, <u>HYE</u> , k, kiel, <u>KL</u> , kpabg, <u>LAU</u> , li, lju, mb, msk, <u>NCY</u> , <u>NEU</u> , rig, riga, str, tall, tcd, tur, u, wa, <u>Z</u>
<u>Eryngium serbicum</u> Pancic	b, bern
<u>Eryngium spinalba</u> Vill.	ad, b, <u>BERN</u> , dbn, <u>HYE</u> , <u>K</u> , kpabg, <u>LAU</u> , mb, <u>NCY</u> , <u>RNG</u> , str, teg, <u>U</u> , ups, wa, <u>Z</u>
<u>Eryngium viviparum</u> Gay	bres
<u>Ferula sadlerana</u> Ledeb.	tur
<u>Heracleum carpaticum</u> Porcius	<u>KPABG</u>
<u>Hladnikia pastinacifolia</u> Reichenb.	<u>LJU</u> , mb, <u>NGOET</u>
<u>Laserpitium archangelica</u> Wulfen	<u>LJU</u>
<u>Naufraga balearica</u> Constance & Cannon	<u>BRES</u> , <u>CGG</u> , hal, <u>HYE</u> , <u>K</u> , <u>NEU</u> , <u>RNG</u>
<u>Oenanthe conioides</u> Lange	<u>HBG</u>
<u>Petagnia saniculifolia</u> Guss.	e, mb
<u>Petroselinum segetum</u> (L.) Koch	<u>HYE</u>
<u>Pimpinella bicknellii</u> Briq.	<u>K</u>
<u>Rouya polygama</u> (Desf.) Coincy	<u>HYE</u>
<u>Seseli gummiiferum</u> Pallas ex Smith	boch, dbn, hal, msk, sta, yalt
<u>Seseli leucospermum</u> Waldst. & Kit.	<u>FRT</u>
<u>Seseli malyi</u> A.Kerner	<u>LJU</u>

Seseli peixoteanum G.Samp.

MA

VALERIANACEAE

Centranthus trinervis (Viv.) Beguinot

hye

Valeriana alliariifolia Adams

b, bern, dbn, gbg, hal, k, KPABG,
lau, li, mosm, tbi, u

Valeriana celtica L. subsp. celtica

LAU, mb, NEU

VIOLACEAE

Viola cazorlensis Gandoger

B, BLAN, gb, K, LAU, mb, NEU, wsy,
Z

Viola comollia Massara

LAU

Viola delphinantha Boiss.

B, NEU

Viola dubyana Burnat ex Gremli

b, lau, ncy, wsy

Viola elegantula Schott

NCY

Viola hispida Lam.

boch, BRES

Viola jaubertiana Mares & Vigineix

CGG, GBG, K, wsy

Viola jooi Janka

ad, alta, b, br, ELSL, K, mb, neu,
riga, tall, TCD, ups, wsy

Viola stojanowii W.Becker

ad, bg, CGG, tur, ups

INDEX OF GARDEN CODES

CODE	INSTITUTION
AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
ALTA	Devonian Botanic Garden, University of Alberta, Room B-414, Biological Sciences Centre, EDMONTON, Alberta T6G 2E9, Canada.
ALTG	Altai Botanical Garden, 493910, POLEVAYA LENINOGORSK, East-Kazakhstan Region, U.S.S.R.
AMD	Hortus Botanicus of the University of Amsterdam, Plantage Middenlaan 2, 1018 DD AMSTERDAM, The Netherlands.
ARKH	Arkhangelsk Dendropark of Forest Chemistry Inst., 163057 ARKHANGELSK, Nikitova, 13, U.S.S.R.
ASKN	Askania Nova, Dendropark, 326332 Khersonsky Region, Chaplin District, Ukraine, U.S.S.R.
ATHD	University of Athens Botanical Garden (Diomides), 405 Iera Street, Dafni, ATHENS, Greece.
ATHU	Athens Botanical Garden, Institute of Systematic Botany, University of Athens, Panepistimiopolis, ATHENS 621, Greece.
AUBSN	Kabardino-Balkar University Botanical Garden, Chernyshevsky Street 173, 360004 NALCHIK, U.S.S.R.
AVU	Hortus Botanicus, Vrije Universiteit, Postbus 7161, 1007 MC AMSTERDAM, The Netherlands.
B	Botanischer Garten Berlin-Dahlem, Konigin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BAK	V.L. Komarov Botanical Institute, Patamdart highway 40, 370122 BAKU 73, Azerbaijan, U.S.S.R.
BATU	Batumi Botanical Garden, Georgian Academy of Sciences, BATUMI, Machindzauri, Georgia, U.S.S.R.
BELA	Belaya Tserkov Dendrological Park, 256400, BELAYA TSERKOV-13, Kiev Region, Ukraine, U.S.S.R.
BERG	Giardino Botanico Bergomense 'L'Rota', Passagio Torre di Adalberto, 24100 BERGAMO, Italy.
BERN	Botanischer Garten der Universität, Altenbergrain 21, CH-3013 BERN, Switzerland.
BESN	Jardin Botanique de la Ville et de la Université, Place du Maréchal Leclerc 25000 BESANCON, France.
BG	Botanisk Hage, P.O. Box 12, N-5014 BERGEN, Norway.

BGAAS	Botanical Garden, Armenian Academy of Sciences, P.O. Avan, 375063 YEREVAN, Armenia, U.S.S.R.
BHBG	Bath Botanical Gardens, Bath City Council, Pump Room, BATH BA1 1LZ, U.K.
BKUR	High Mountain Botanical Garden, BAKURIANI, Georgia, U.S.S.R.
BID	Fleverhof, BIDDINGHUIZEN, The Netherlands.
BLAN	Jardin Botanico Marimurta, Fundacion Carlos Faust, Estacion Int. de Biologia Mediterranea, BLANES, Provincia Gerona, Spain.
BMBG	Birmingham Botanical Gardens, Westbourne Road, Edgbaston, BIRMINGHAM B15 3TR, U.K.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BORD	Jardin Botanique de Bordeaux, Terrasse du Jardin Public, Place Bardineau 33000 BORDEAUX, France.
BPU	Institutum Botanicum et Hortus Botanicus, Illes Utca 25, H-1083 BUDAPEST, Hungary.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
BRES	Conservatoire Botanique de Stangelarc'h, 29200 BREST, France.
BRIS	Parco Botanico de Cantone Ticino, Isole di Brissago, CH-6614 LOCARNO, Switzerland.
BRIST	University of Bristol Botanic Garden, Department of Botany, Woodland Road, BRISTOL BS8 1UG, U.K.
C	Kobenhavns Universitets Botaniske Have, O Farimagsgade 2B, DK-1353 KOBENHAVEN, Denmark.
CBG	Canberra National Botanic Gardens, CANBERRA, A.C.T. 2601, Australia.
CGG	Cambridge University Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
CHER	Chernovtsy University Botanic Garden, Fedkovich Street 11, 274022, CHERNOVTSY, Ukraine, U.S.S.R.
CHIC	Chicago Botanic Garden, P.O. Box 400, GLENCOE, Illinois 60022, U.S.A.
CHIS	Botanic Garden of Moldavian Academy of Sciences, Lesnaya 18, KISHINEV, Moldavia, U.S.S.R.

DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Ireland.
DELF	Cultuurtuin voor Technisch Gewassen, Technisch Hogeschool Delft, Julianalaan 67, Postbus 5057, 2600 GB DELFT, The Netherlands.
DHM	University of Durham Botanic Garden, Surveyor's Department, Hollow Drift, Green Lane, DURHAM DH1 3LA, U.K.
DR	Botanischer Garten der Technischen Universität, Stubelallee 2, DDR-8019, DRESDEN, German Democratic Republic.
DTSK	Donetsk Botanic Garden, Elevatornaya Street 19, 340079 DONETSK 3, U.S.S.R.
DUSS	Botanischer Garten der Universität Dusseldorf, Universitätstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
DZHB	Dzhezkazgan Botanic Garden, DZHEZKAZGAN 1, Kazakh, U.S.S.R.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.
ELSL	Kruiden/Heemtuin-I.V.N.-Elsloo, Op den Berg 7, ELSLOO (LIMB.), The Netherlands.
ER	Botanischer Garten der Universität, Loschgestrasse 3, D-852 ERLANGEN, Federal Republic of Germany.
FB	Botanischer Garten der Universität Schanzlestrasse 1, D 7800 FREIBURG, Federal Republic of Germany.
FRT	Botanischer Garten der J.W. Goethe-Universität, Seismayerstrasse 72, 6 FRANKFURT-am MAIN, Federal Republic of Germany.
FRU	Botanic Garden of Kirghiz Academy of Sciences, 50'let Oktiabria Street 1a, FRUNZE, U.S.S.R.
G	Conservatoire et Jardin Botaniques, Case postale 21, CH-1211, GENEVA 21, Switzerland.
GB	Göteborg Botanical Garden, Carl Skottsbergs Gata 22, S-413 19 GÖTEBORG, Sweden.
GBG	Glasgow Botanic Gardens, GLASGOW G12 0UE, U.K.
GENT	Plantentuin der Rijksuniversiteit, K.L. Ledeganckstraat 35, B-9000 GENT, Belgium.

GOET	Alter Botanischer Garten der Universität, Untere Karspule 1, D-3400, GOTTINGEN, Federal Republic of Germany.
GORK	Botanical Garden, Gorky State University, 603062, GORKY 62, U.S.S.R.
HAL	Botanischer Garten der Martin-Luther-Universität, Am Kirchtor 3, 402 HALLE, German Democratic Republic.
HARR	Harlow Car Gardens, HARROGATE, N. Yorkshire HG3 1QB, U.K.
HBG	Institut für Allgemeine Botanik und Bot. Garten, Heston 10, 2000 HAMBURG 52, Federal Republic of Germany.
HK	Agriculture and Fisheries Department, 393 Canton Road, 12/F, KOWLOON, Hong Kong.
HKUS	Urban Services Department, 12th Floor, West Wing, Central Government Offices, HONG KONG.
HLU	University of Hull Botanic & Experimental Garden, Thwaite Street, COTTINGHAM, Yorkshire, U.K.
HYE	Parque National de Port Cros, 50 Avenue Gambetta, 83400 HYERES, France.
IAGB	University Botanic Garden, Str. Dumbrava Rosie Nr. 9, IASI, Romania.
IRVC	The Irvine Arboretum, School of Biological Science, IRVINE, California 92717, USA.
K	Royal Botanic Gardens, KEW, Richmond, Surrey TW9 3AB, U.K.
KALI	University Botanical Garden, Belomorskaya Street 20, 236029, KALININGRAD, U.S.S.R.
KARA	Karaganda Botanical Garden, 470032 KARAGANDA 32, Kazakh, U.S.S.R.
KAUN	Botanical Garden of the Botanical Institute, Botanikos 4, KAUNAS 233019, Lithuania, U.S.S.R.
KBAI	Dendrarium of the Kuban Agricultural Institute, Kalinina Street 13, KRASNODAR 44, U.S.S.R.
KHAR	University Botanical Garden, Klochkovskaya 52, 310022 KHARKOV, U.S.S.R.

KIEL	Botanischer Garten der Universität Kiel, Olshaustenstrasse 40-60, Biologie zentrum, D-2300 KIEL, Federal Republic of Germany.
KIEV	University Botanic Garden, Komintern Street 1, 252032 KIEV 32, Ukraine, U.S.S.R.
KL	Botanischer Garten des Landes Kärnten, Kinkstrasse 6, 9020 KLAGENFURT, Austria.
KON	Botanischer Garten der Universität Konstanz, Postfach 7733, 7750 KONSTANZ, Federal Republic of Germany.
KPABG	Polar-Alpine Botanic Garden, 184230 KIROVSK 2, Murmansk Region, U.S.S.R.
KUIB	Kuibyshev Botanic Garden of Pedagogical Institute, Moscovskoe Shosse 36, 443086 KUIBYSHEV, U.S.S.R.
KWHA	Central Republic Botanic Garden, Timiryazevskaya Street 1, 252014 KIEV 14, Ukraine, U.S.S.R.
L	Leiden University Botanic Garden, Nonnensteeg 3, 2311 LEIDEN, The Netherlands.
LATT	Giardino Botanico 'Hanbury', La Mortola, I-18036 LATTE, Ventimiglia, Italy.
LAU	Jardin Botanique de Lausanne, 14 bis, Avenue de Cour, CH-1007 LAUSANNE, Switzerland.
LDS	Botanical Experimental Garden, Department of Plant Sciences, University of Leeds, LEEDS LS2 9JT, U.K.
LE	Botanical Garden, Komarov Botanical Institute, Professor Popov Street 2, 197022 LENINGRAD 22, U.S.S.R.
LECB	University Botanical Garden, Universitetskaia nab. 7-9 199164 LENINGRAD B-164, U.S.S.R.
LI	Botanischer Garten und Arboretum der Stadt Linz, Bancalari weg 41, A 4020 LINZ, Austria.
LISJC	Jardim e Museu Agrícola do Ultramar, BELEM-LISBOA 1400, Portugal.
LIVC	Liverpool City Botanic Gardens, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
LIVU	University of Liverpool Botanic Gardens, Ness, South Wirral L64 4AY, U.K.
LJU	Hortus Botanicus Universitatis, Izanska c. 15, YU-61000 LJUBLJANA, Yugoslavia.

LVOP	Arboretum of Forestry Institute, Pushkin Street 103, LVOV, Ukraine, U.S.S.R.
MA	Real Jardin Botanico, Instituto Botanico Cavanilles, Plaza de Murillo 2, MADRID 14, Spain.
MB	Botanischer Garten der Philipps-Universität, Auf den Lahnbergen, 3550 MARBURG, Federal Republic of Germany.
MESH	Dendropark of Forest Steppe, MESHCHERSKOE, U.S.S.R.
MHA	Moscow Main Botanic Garden, Herbarium, Academy of Sciences, MOSCOW U-276 U.S.S.R.
MIL	Mitchell Park Conservatory, 524 South Layton Boulevard, MILWAUKEE Wisconsin 53215 U.S.A.
MOSM	Botanic Garden, All-Union Research Institute of Medicinal Plants, 142790, PO box Vilar, MOSCOW, U.S.S.R.
MSK	Central Botanical Garden, 2a Surganova Street, 220072 MINSK 72, Byelorussia, U.S.S.R.
MTJB	Jardin Botanique de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec HIX 2B2, Canada.
MW	Botanical Garden, Moscow Lomonosov State University, MOSCOW V-234, U.S.S.R.
NALC	Kabardino-Balkar Botanic Garden 360002 PO, NALCHIK-DOLINSK, U.S.S.R.
NCY	Jardins Botaniques de Nancy, 100, Rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NEU	Jardin Botanique de Neuchatel, Rue E-Argand 11, CH-2000 NEUCHATEL 7, Switzerland.
NGOET	Neuer Botanischer Garten der Universität Göttingen, Grisebachstrasse 1a, D-3400 GOTTINGEN, Federal Republic of Germany.
NIJ	University Botanic Garden, Department of Botany, Toernooiveld, NIJMEGEN, The Netherlands.
NOVB	Central Siberian Botanical Garden, Zolotodolinskya 101, 630090 NOVOSIBIRSK 90, U.S.S.R.
NPNZ	Pukekura Park, Parks and Recreations Department, City Council, Private Bag, NEW PLYMOUTH, New Zealand.
NSM	Sun-Yat-Sen Memorial Botanical Garden, NANJING, Kiangsu Province, China.

O	University Botanical Garden, Trondheimsveien 23B, OSLO 5, Norway.
OMSK	Botanic Garden of the Agricultural Institute, Post Office 8, OMSK, U.S.S.R.
ORT	Jardin de Aclimatacion de La Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
OULU	Botanical Garden, Department of Botany, University of Oulu, Box 191, SF-90101 OULU 10, Finland
PALZ	Ente Giardini Botanici Villa Taranto, I-28048 VERBANIA PALLANZA, Lago Maggiore, Italy.
PAV	Istituto et Orto Botanico dell Universita de Pavia, Via San Epifanio 14, 27100 PAVIA, Italy.
PRC	Hortus Botanicus Universitatis Cardinae, Benatska 2,j 12801 PRAGUE 2, Czechoslovakia.
PRU	Department of Botany, University of Pretoria, PRETORIA 0002, South Africa.
RIG	Botanical Garden, Latvian State University, L. Kandavas Street 2, 226007 RIGA 7, Latvia, U.S.S.R.
RIGA	Botanical Garden, Latvian Academy of Sciences, 229021 Riga P.O. SALASPILS, Latvia, U.S.S.R.
RNG	Plant Science Botanic Garden, Plant Science Laboratories, University of Reading, Whiteknights, READING RG6 2AS, U.K.
ROT	Arboretum Trompenburg, Groene Wetering 46, 3062 PC ROTTERDAM, The Netherlands.
RV	University Botanical Garden, 344000 ROSTOV on DON, P.O 2, U.S.S.R.
SARAT	University Botanical Garden, Astrakhanskaya Street 83, 410072 SARATOV, U.S.S.R.
SASY	Botanical Garden, Yakutsk Academy of Sciences, Churchur-Muran, 677008, YAKUTSK, U.S.S.R.
SBG	Stavropol Botanic Garden, Lenin Street 478, 355000 STAVROPOL, U.S.S.R.
SDZO	San Diego Zoological Gardens, Box 551, SAN DIEGO, California 92112, U.S.A.
SHF	Experimental Gardens, University of Sheffield, 26 Taptonville Road, SHEFFIELD, S10 5BR, U.K.

STA	University Botanic Gardens, ST ANDREWS, Fife, KY16 8RT, Scotland.
STR	Jardin Botanique de l'Université Louis Pasteur, 18 rue Goethe, F 67083, STRASBOURG, France.
SUCH	Sukhumi Botanical Garden, Georgian Academy of Sciences, Chavchavadze Street 20, 384933 SUKHUMI, Georgia, U.S.S.R.
SVER	Botanical Institute of Ecology, 8 March Street 202, 620008 SVERDLOVSK 8, U.S.S.R.
SVUR	Botanical Garden, Ural State University, Lenin Avenue 51, 620083 SVERDLOVSK, U.S.S.R.
TALL	Botanical Garden, Academy of Sciences, Kloostrimetsa Street, 44, 200019 TALLINN, Estonia, U.S.S.R.
TASH	Botanical Garden, Uzbek Academy of Sciences, Jakhan-Abidoroi Street-272, 700000 TASHKENT 53, Uzbek, U.S.S.R.
TBI	Tbilisi Central Botanical Garden, 380005, TBILISI PO5, Georgia, U.S.S.R.
TCD	Trinity College Botanic Garden, School of Botany, Trinity College, DUBLIN 2, Ireland.
TEG	Jochum-Hof, Maashoek 2b, STEYL, Gem. Tegelen, The Netherlands.
TIM	Timaru Botanic Garden, Parks and Recreation Department, City Council, P.O. Box 522, TIMARU, New Zealand.
TK	Siberian Botanic Garden, Tomsk State University, V.V. Kuibsheva, Lenin Avenue 36, TOMSK, U.S.S.R.
TRES	Tresco Abbey Gardens, TRESCO, Isles of Scilly, Cornwall, U.K.
TRH	Ringve Botanical Garden, 7000 TRONDHEIM, Norway.
TROS	Trostyanets Dendropark of Central Republic Botanical Garden, 251334 ICHNYA region, Ukraine, U.S.S.R.
TU	University Botanical Garden, Michurin Street 4, 202400 TARTU, Estonia, U.S.S.R.
TUR	University of Turku Botanical Garden, SF-20500 TURKU 50, Finland.
U	University Botanical Gardens, Transitorium 2, Heidelberglaan 2, 3508 TC - UTRECHT, The Netherlands.

- UBC Botanic Garden, University of British Columbia, 6501 Northwest Marine Drive, VANCOUVER, B.C., Canada V6T 1W5.
- UFA Botanic Garden of Bashkir Academy of Sciences, Polarnaya Street 8, 450022 UFA, U.S.S.R.
- UMAN Dendrological Park, 'Sofievka', 258900 UMAN, Chercassy region, U.S.S.R.
- UPS Uppsala Botanic Garden, Villavagen 8, S-75236 UPPSALA, Sweden.
- USSU Ussuriisk Dendropark, Primorsky District, 692533 USSURIISK P.O. Gornotaezhnoe USSR
- UU Uzhgorod University Botanic Garden, Oktjabrsky Street 60, UZHGOROD, Zakarpatsky region, Ukraine, U.S.S.R.
- VOR University Botanical Garden, 394012 VORONEZH 12, U.S.S.R.
- WA University Botanic Garden, Al. Ujazdowskie 4, 00-478 WARSAW, Poland.
- WAG Belmonte Arboretum and Botanical Gardens, Agricultural University, Generaal Foulkesweg 37, 6703 BL WAGENINGEN, The Netherlands.
- WESB Westonbirt Arboretum, (Forestry Commission - Research), TETBURY, Glos. GL8 8QS, U.K.
- WI Botanical Garden, Vilnius State University, Churlionio 110, VILNIUS, Lithuania, U.S.S.R.
- WRSL Ogrod Botaniczny, UL. Kochanowskiego 10, WROCLAW, Poland.
- WSY The Royal Horticultural Society Garden, WISLEY, Ripley, Woking, Surrey GU23 6QB, U.K.
- WTU Washington Park Arboretum, Center for Urban Horticulture GF-15, University of Washington, SEATTLE, Washington 98195, U.S.A.
- YALT State Nikita Botanical Gardens, YALTA, Crimea, Ukraine, U.S.S.R.
- YOSH Dendrarium of Maryiski Institute, Sovietskaya Street 152, 424024 YOSHKAR-OLA, U.S.S.R.
- Z University of Zurich Botanic Gardens, Zollikerstrasse 107, CH-8008 ZURICH, Switzerland.



INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES

Conservation Monitoring Centre — Centre de surveillance continue de la conservation de la nature

The Herbarium, Royal Botanic Gardens,
Kew, Richmond, Surrey, TW9 3AE, U.K.

BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY
REPORT NO. 13

THE BOTANIC GARDENS LIST OF RARE AND THREATENED SPECIES OF MEXICAN CACTI

COMPILED BY THE THREATENED PLANTS UNIT
OF THE IUCN CONSERVATION MONITORING CENTRE
AT THE ROYAL BOTANIC GARDENS, KEW

FROM INFORMATION RECEIVED FROM SUBSCRIBERS TO THE
BOTANIC GARDENS CONSERVATION CO-ORDINATING BODY

IUCN would like to express its warmest thanks to all the specialists,
technical managers and curators who have contributed information.

KEW, January 1985

INTRODUCTION

Here are the results of the survey of the presence in botanic gardens of the rare, threatened and insufficiently known endemic cacti of Mexico, a list of which we circulated to the gardens subscribing to the Botanic Gardens Conservation Co-ordinating Body in July 1983.

In the wild many of the species are in danger, due partly to their natural rarity but made greatly worse by the depredations of collectors for the horticultural market. It is encouraging, but not altogether unexpected, to find that all but 20 of the 301 taxa on the list circulated have been located in cultivation. However, it is disappointing to see how few are of known wild source origin and for how few of these there is propagating material to spare. To help us make sense of the results of the survey, we asked David Hunt, cactus specialist at Kew and a member of the IUCN-SSC Cactus and Succulent Specialist Group, to interpret the data for us. This is his verdict:

The level of response is very encouraging, both in the number of gardens that responded, and in the number of taxa recorded as grown. Of the very few taxa not located, several are of very dubious taxonomic status (i.e. they probably do not exist!) and others are almost certainly held in specialist collections by amateur growers.

My first general observation is that many of the species regarded as Endangered or Vulnerable carry long lists of gardens where they are grown: not surprisingly since they are the 'choice' species that have been most subject to the depredations of collectors! But few gardens volunteer duplicate material. Future surveys, therefore, might try to establish which gardens have succeeded in propagating these taxa clonally, producing seed under controlled conditions, or raising from seed. The fact that species are in cultivation is little comfort if they cannot be kept going without periodic re-stocking from the wild.

My second observation is that the percentage of reports of material of known wild source appears to be small. Hopefully, future surveys will show the proportion of documented material improving, as gardens become more data-conscious and modernize their recording systems. For some 'well known' species, such as Echinocactus grusonii, there is no great necessity for cultivated material to be of known wild origin, but the more 'critical' or controversial species are, in taxonomic terms, the more valuable the pedigree of the material one has, especially if it goes back to a wild population. This is because taxonomy itself is subjective - opinions vary on what can be included in a species - and identification is almost always relative, whereas source data are factual.

As a family the Cactaceae are noteworthy for their propensity for local variation (attributable to a variety of factors), and the inherent taxonomic problems have been aggravated by their popularity in horticulture, coupled with the difficulty of making herbarium specimens.

The long and the short of this is a wide discrepancy between what the specialist cactus collector understands as a species, and the more orthodox botanical viewpoint. (It is, of course, a difference of opinion not unknown in other groups of horticultural interest!). Unfortunately, it means that, where more complex and variable species and species groups are concerned, one cannot take listed names at face value. The absence of a threatened species from the list of species in cultivation does not mean, necessarily, that it is not in cultivation, since specimens of it could be being grown under the umbrella-name of a more widely-conceived species. Conversely, one must realize that quite a number of the species listed can be regarded as only local variants or even populations (which may indeed be threatened) of species which, over their wider distribution, are not regarded as threatened. One must also be cautious of accepting the claims of different gardens to be growing certain 'critical' taxa if the origin of that material is unknown or uncertain. There are cases I could cite on the list where the identification given is probably 'wishful thinking'.

The taxonomist interested in conservation (as all should be!) may face a conflict of interests where 'critical' taxa are concerned. The more broadly species are defined, the more individuals they will cover, and therefore, the less threatened they will be! To highlight local variants and populations, especially those under threat, one must be a 'splitter'! One solution is to recognize numbers of infraspecific taxa, but it is not a way out that appeals to me since it not only fails to cope with the subjectivity of taxonomic opinion but clogs up lists (and computers) with inordinately long names (for which, incidentally, the Code of Nomenclature is not very well equipped). Ultimately, the best solution will be to record and catalogue all wild populations, at least of rare and critical taxa, but in the interim the ordinary data of collector's name and number, referring to a single location, can and should be used both to add precision to identification and also to provide information on geographical distribution.

As I suggested earlier, the broader one's species, the less likely they are to be considered threatened. Overall, our taxonomic understanding of the Cactaceae, at species level, is still rather primitive, and we can hardly begin to assess which taxa are threatened when the taxa themselves are not well defined. It would be very helpful if this very instructive IUCN survey could eventually be extended to cover all proposed taxa of Cactaceae, starting with all those represented by material of known wild source.

IUCN will study these conclusions carefully and decide what follow-up is appropriate. Dr Hunt's analysis does bear out some of the precepts of our plan for the future development of the 'Body', as outlined in the booklet on the IUCN/WWF Plant Conservation Programme 1984/5 circulated to subscribers last year.

This report gives the information we have to date. It is in two sections.

The first part is the list that gives the names of rare, threatened and insufficiently known endemic Mexican cacti that have so far been located in one or more botanic gardens. After each name is given the codes of those gardens known to be holding material of the species.

Second are the names and addresses of the botanic gardens which hold material of the listed species, with their codes.

The aim is that those members which would like to grow the plants concerned can then make direct contact with the gardens who have material to spare. We hope this feature will be of especial use to managers and curators of botanic gardens in planning and building their collections, and help remove pressure on wild collections.

The Royal Botanic Gardens, Kew (Code K) will be pleased to propagate and distribute to other members on request any species marked on the list as growing at Kew.

Key

Upper case underlined (e.g. ABCD) indicates plants from a known wild source.

Upper case alone (e.g. ABCD) indicates plants from a known cultivated source.

Lower case (e.g. abcd) indicates plants from an unknown source.

+ following the code indicates that duplicate material is available.

Where a garden holds both wild and cultivated source material, the code to indicate known wild source is used as, clearly, the wild source material is the more valuable.

RARE, THREATENED AND INSUFFICIENTLY KNOWN ENDEMIC

MEXICAN CACTI

CACTACEAE

<u>Acanthocereus subinermis</u> Britton & Rose	frp, <u>HNT</u>
<u>Aporocactus flagelliformis</u> (L.) Lemaire	AA, amd, b, BID, boch, BR, brist, cgg, CHIC, CHRC, frp, goet, h, hlu, KAZZ, KIEL, KPABG, KWAH, LE, livc, mb+, mel, msk, MTJB, MW+, NCY, ORT+, pac+, RIGA, RIGG, rng+, SWSD, tall, tcd, TEG, TUR+, u, UPS, wa, YALT, zss
<u>Aporocactus flagriformis</u> (Zucc.) Lemaire	BR, frp, goet, KIEL, MTJB
<u>Aporocactus leptophis</u> (DC.) Britton & Rose	BR, frp, hnt
<u>Ariocarpus agavioides</u> (Castaneda) E.F.Anderson	B, boch, frp, <u>HNT</u> , KWAH, LE, M, PRE, RNG, <u>ZSS</u>
<u>Ariocarpus kotschoubeyanus</u> (Lemaire) K.Schum.	amd, B, boch, BR, frp, <u>HNT</u> , <u>K</u> , KWAH, LE, M, MB, MCAR, MW, PRE, RIGA, RNG, TUR+, <u>ZSS</u>
<u>Ariocarpus retusus</u> Scheidw. var. <u>retusus</u>	B, BR, frp, <u>HNT</u> , LE, M, MCAR, PRE, ROT, <u>ZSS</u>
<u>Ariocarpus retusus</u> Scheidw. var. <u>furfuraceus</u> (Wats.) Frank	AA, LE, M, <u>MCAR</u> , PRE, RIGA, rng, ZSS
<u>Ariocarpus scapharostrus</u> Boedeker	amd, boch, frp, <u>GOET</u> , <u>HNT</u> +, KWAH, LE, PRE, RNG, <u>ZSS</u>
<u>Ariocarpus trigonus</u> K.Schum.	AA, amd, B, BID, BR, FRP, <u>HNT</u> , K, KWAH, LE, LECB, M, MCAR, MHA, mil, PRE, RIGA, RIGG, rng, TEG, <u>XAL</u> , <u>ZSS</u>
<u>Astrophytum capricorne</u> (A.Dietr.) Britton & Rose	AD+, B, BERN, BID, boch, BR, CHRC, dtsk, <u>FRP</u> , <u>GOET</u> , <u>HNT</u> , K, KIEL, kwha, LE, LECB, LIVC, MB, MCAR+, MHA, MIL, mo, MW+, NCY, NIJ, NOVB, RIGA, RIGG, rng, ROT, TK, u, UPS, <u>XAL</u> , YALT, YOSH, <u>ZSS</u>
<u>Astrophytum myriostigma</u> Lemaire	AA, AD+, B, BERN, BID, blan+, boch, BR, brist, CGG, DBN+, DTSK, DUSS, E, frp, GBG, goet, H, HLU, <u>HNT</u> , K, KALI, KAZZ, KIEL, KPABG, KWAH, I, LE, LECB, LIVC, M, MB,

<u>Astrophytum ornatum</u> (DC.) A.Weber	MCAR+, MHA, MIL, MO+, msk, MW, NCY, NIJ, NOVB, OULU, RIGA, RIGG, rng, ROT, SVER, TALL, TEG, TK, TUR+, u, UPS, wa, YALT+, YOSH, <u>ZSS</u>
<u>Aztekium ritteri</u> (Boedeker) Boedeker	AA, AD+, B, BERN, BID, blan+, boch, BR, CGG, chic, CHRC, DBN+, DUSS, E, frp, goet, H, <u>HNT</u> , K, kali, KIEL, KWHA, LE, LECB, LVC, M, mb, MCAR+, MHA, MIL, MO+, MW, NCY, NIJ, ort+, OULU, RIGA, RIGG, rng, ROT, SVER, TALL, TEG, TUR+, u, UPS, YALT+, <u>ZSS</u>
<u>Backebergia militaris</u> (Audot) H.Bravo	b, boch, BR, CHRC, FRP, goet, HNT, K, KIEL, KWHA, LE, LECB, M, MHA, msk, PRE, RIGA, RNG, <u>XAL</u> , YOSH, <u>ZSS</u>
<u>Cephalocereus apicicephalum</u> E.Y.Dawson	chic+, frp, hnt, KWHA, MCAR, mil, MO, ZSS
<u>Cephalocereus cometes</u> Scheidw.	ZSS
<u>Cephalocereus senilis</u> (Haw.) Pfeiffer	ad+, br, frp, GOET, hnt, NCY, NOVB+, ZSS
<u>Cephalocereus tehuacanus</u> (Wein.) Borg	AA, AD+, amd, b, BERN, BID, BLAN, boch, BR, brist, CGG, e, HNT, k, KIEL, KWHA, LE, LECB, M, mb, MCAR, mel, MO, MTJB, NCY, ort+, RIGA, RIGG, rng, SWSD, tall, TK, TUR+, UPS, YALT, <u>ZSS</u>
<u>Coryphantha echinoidea</u> (Quehl) Britton & Rose	frp, <u>ORT</u> +
<u>Coryphantha elephantidens</u> (Lemaire) Lemaire	AA, frp, GOET, LECB, MCAR, RIGG, ZSS
<u>Coryphantha gladiispina</u> Boedeker	amd, b, BID, boch, BR, GOET, <u>HNT</u> , KWHA, LE, M, MCAR, MHA, NCY, RIGG, <u>RNG</u> , YOSH, <u>ZSS</u>
<u>Coryphantha greenwoodii</u> H.Bravo	AA, b, BID, BR, frp, MCAR, RIGG, <u>ZSS</u>
<u>Coryphantha maiz-tablasensis</u> Backeb.	BR, frp, GOET, <u>HNT</u> , ZSS
<u>Coryphantha melleospina</u> H.Bravo	B, BID, boch, BR, FRP, HNT, MB, mil, NOVB, RIGA, ZSS
	AA

<u>Coryphantha poselgeriana</u> (A.Dietr.) Britton & Rose var. <u>poselgeriana</u>	BID, GOET, <u>ZSS</u>
<u>Coryphantha pseudechinus</u> Boedeker	CHRC, FRP, m, MTJB, RIGG
<u>Coryphantha pulleineana</u> (Backeb.) Glass	MCAR, ZSS
<u>Coryphantha reduncuspina</u> Boedeker	AD+, b, BID, BR, CHRC, FRP, LECB, MCAR, NCY, rng, ZSS
<u>Coryphantha schwarziana</u> Boedeker	AA, b, NOVB
<u>Coryphantha valida</u> (J.A.Purpus) Bremer	AD+, B, <u>HNT</u> , RIGG
<u>Coryphantha werdermannii</u> Boedeker	MCAR, MTJB
<u>Cryptocereus anthonyanus</u> Alexander	AD+, B, <u>BERN</u> , <u>BR</u> , brist, chic+, DBN,frp, goet, K, m, MB+, MTJB, NCY, pac+, tall
<u>Cumarinia odorata</u> (Boedeker) F.Buxb.	BID, boch+, BR, frp+, GOET, M, MCAR+, NCY, rigg, rng, ZSS
<u>Echinocactus grusonii</u> Hildm.	AA, ad+, amd, B, BATU, <u>BERN</u> , BID, BLAN+, boch, <u>BR</u> , BRES, brist, cgg, chic+, CHRC, <u>DBN</u> +, DTSK, duss, E, frp, GBG, goet, h, hlu, HNT, K, KALI, KAZZ, KIEL, KIEV, KPABG, KWHA, l, LAU, LE, LECB, LIVC, M, MB+, MCAR+, mel, MHA, MIL, MO+, msk, MTJB, MW, NIJ, ORT+, OULU, pav, PRE, RIGA, RIGG, rng, SWSD, TALL, TEG, tim, TK, TUR+, UPS, wa, wag, <u>XAL</u> , YALT, YOSH, ZSS
<u>Echinocactus platyacanthus</u> Link & Otto	B, BERN, blan, boch, BR, chrc, <u>DBN</u> +, DTSK, E, goet, hlu, hnt, K, LIVC, MHA, MO, msk, mtjb, NOVB+, SWSD, tim, TK, TUR+, UPS, <u>XAL</u> , YALT, ZSS
<u>Echinocereus adustus</u> Engelm.	<u>HNT</u> , MHA, TUR+, ZSS
<u>Echinocereus amoenus</u> (A.Dietr.) K.Schum.	B, BR, FRP, <u>HNT</u> , LE, RIGG, rng, ZSS
<u>Echinocereus chlorophthalmus</u> (Hook.) Britton & Rose	NOVB
<u>Echinocereus delaetii</u> Gurke	B, BID, BR, FRP, GOET, KWHA, LE, M, mb, MCAR, MO, MTJB, NOVB, RIGG, rng, TEG, <u>ZSS</u>

<u>Echinocereus durangensis</u> Poselger	b
<u>Echinocereus ehrenbergii</u> (Pfeiffer) Ruempler	b, FRP, M, UPS, ZSS
<u>Echinocereus floresii</u> Backeb.	b, BID, <u>HNT</u> , M, MCAR, ZSS
<u>Echinocereus huitcholensis</u> (A.Weber) Gurke	<u>HNT</u> , YOSH
<u>Echinocereus knippelianus</u> Liebner var. <u>knippelianus</u>	B, BID, BR, FRP, GOET, HNT, KWHA, LE, M, MCAR, RIGG, rng, ROT, UPS, <u>ZSS</u>
<u>Echinocereus knippelianus</u> Liebner var. <u>kruegeri</u> Glass & R.Foster	BR, <u>HNT</u> , <u>ZSS</u>
<u>Echinocereus laui</u> G.Frank	FRP, GOET, <u>HNT</u> , M, rng, <u>ZSS</u>
<u>Echinocereus leeanus</u> (Hook.) Lemaire var. <u>leeanus</u>	b, ZSS
<u>Echinocereus leeanus</u> (Hook.) Lemaire var. <u>multicostatus</u> (Cels) K.Schum.	ZSS
<u>Echinocereus lindsayi</u> Meyran	AA, FRP, HNT, ZSS
<u>Echinocereus longisetus</u> (Engelm.) Ruempler	frp, <u>HNT</u> , MCAR+, UPS, <u>ZSS</u>
<u>Echinocereus matthesianus</u> Backeb.	ZSS
<u>Echinocereus morricalii</u> Riha	GOET, <u>HNT</u> +, MCAR, ZSS
<u>Echinocereus nivosus</u> Glass & R.Foster	GOET, <u>HNT</u> , <u>ZSS</u>
<u>Echinocereus palmeri</u> Britton & Rose	B, <u>K</u> , rng, TK, <u>ZSS</u>
<u>Echinocereus pamanesiorum</u> Lau	<u>ZSS</u>
<u>Echinocereus primolanatus</u> Schwarz	BID, BR, HNT, kali, KWHA, LE, m, TK, ZSS
<u>Echinocereus pulchellus</u> (Martius) K.Schum.	AA, B, BID, boch, frp, GOET, LE, m, mcar, RIGG, ZSS
<u>Echinocereus sarissophorus</u> Britton & Rose	b, bern, <u>FRP</u> , <u>ZSS</u>
<u>Echinocereus sciurus</u> (K.Brandegee) Britton & Rose	b, BID, boch, <u>FRP</u> , GOET, <u>HNT</u> , LE, mcar, rng, <u>TUR</u> +, <u>ZSS</u>

<u>Echinocereus spinibarbis</u> W.Haage	b, ZSS
<u>Echinocereus subinermis</u> Salm-Dyck var. <u>subinermis</u>	b, BID, BR, GOET, <u>HNT</u> , KAZZ, KWAH, LE, m, MCAR+, msk, RIGA, rng, YOSH, ZSS
<u>Echinocereus subinermis</u> Salm-Dyck var. <u>luteus</u> (Britton & Rose) Backeb.	frp, rn, MCAR, RIGG, TEG, ZSS
<u>Echinocereus subterraneus</u> Backeb.	frp, GBG, MCAR, <u>ZSS</u>
<u>Echinocereus triglochidiatus</u> Engelm. var. <u>acifer</u> (Otto) H.Bravo	BID, FRP, m, MO, ZSS
<u>Echinocereus uspenski</u> W.Haage	b, boch, frp, MTJB
<u>Echinomastus unguispinus</u> (Engelm.) Britton & Rose var. <u>unguispinus</u>	frp, <u>HNT</u> , <u>ZSS</u>
<u>Echinomastus unguispinus</u> (Engelm.) Britton & Rose var. <u>laui</u> (G.Frank & Zech.) Glass & Fos.	<u>HNT</u> , TALL, <u>ZSS</u>
<u>Epiphyllum anguliger</u> (Lemaire) G.Don	AA, b, boch, BR, <u>CGG</u> , e, FRP, GBG, goet, <u>HNT</u> , K, KWAH, LE, livc, m, mb+, mel, MHA, MW+, NCY, NOVB, OULU, RIGA, rng+, SWSD, ZSS
<u>Epiphyllum caudatum</u> Britton & Rose	AA, <u>HNT</u> , K, SVER, ZSS
<u>Epiphyllum chrysocardium</u> Alexander	B, BR, BRES, FRP, goet, <u>HNT</u> , K, mil, MTJB, NCY, SWSD, u, <u>ZSS</u>
<u>Epiphyllum stenopetalum</u> (Forster) Britton & Rose	AD+, b, BR, frp, ZSS
<u>Epithelantha micromeris</u> Britton & Rose var. <u>densispina</u> (H.Bravo) Backeb.	KWAH, MO
<u>Epithelantha micromeris</u> Britton & Rose var. <u>greggii</u> (Engelm.) Borg	boch+, CHRC, LE, rng, ZSS
<u>Epithelantha micromeris</u> Britton & Rose var. <u>pachyrhiza</u> Marshall	le, m, mil, ZSS
<u>Epithelantha micromeris</u> Britton & Rose var. <u>polycephala</u> (Backeb.) Glass & R.Foster	FRP, <u>HNT</u> , NOVB, rigg, YALT, ZSS
<u>Epithelantha micromeris</u> Britton & Rose var. <u>rufispina</u> (H.Bravo) Backeb.	<u>ZSS</u>

<u>Epithelantha micromeris</u> Britton & Rose var. <u>unguispina</u> (Boedeker) Backeb.	BR, <u>ZSS</u>
<u>Escobaria asperispina</u> (Boedeker) D.R.Hunt	MO, MTJB, <u>ZSS</u>
<u>Escobaria chaffeyi</u> Britton & Rose	FRP+, <u>HNT</u> , LE, m, MCAR, MHA, RIGG, rng, ZSS
<u>Escobaria laredoi</u> (Glass & R.Foster) N.P.Taylor	<u>ZSS</u>
<u>Escobaria lloydii</u> Britton & Rose	RIGG, ZSS
<u>Escobaria roseana</u> (Boedeker) Backeb.	AA, BR, LE, M, MCAR, MHA, RIGG, <u>ZSS</u>
<u>Ferocactus bicolor</u> (Pfeiffer) N.P.Taylor var. <u>bolaensis</u> (Runge) N.P.Taylor	AA, B, BID, BR, <u>HNT</u> , u, UPS, <u>ZSS</u>
<u>Ferocactus bicolor</u> (Pfeiffer) N.P.Taylor var. <u>schwarzii</u> (Backeb.) N.P.Taylor	goet, ZSS
<u>Ferocactus chrysacanthus</u> (Orcutt) Britton & Rose	AA, FRP, GOET, <u>HNT</u> , M, MCAR, rng, ZSS
<u>Ferocactus johnstonianus</u> Britton & Rose	LE, MCAR, PRE
<u>Ferocactus mathssonii</u> (K.Schum.) N.P.Taylor	B, K, LE, YALT
<u>Ferocactus recurvus</u> (Miller) Borg var. <u>greenwoodii</u> C.Glass	<u>HNT</u> , KWHA, LECB, mil, ZSS
<u>Gymnocactus aguirreanus</u> Glass & R.Foster	DBN, GOET, MCAR, <u>ZSS</u>
<u>Gymnocactus beguinii</u> (K.Schum.) Backeb.	frp, goet, kali, KWHA, LE, m, MCAR, MHA, NOVB, RIGA, YALT, ZSS
<u>Gymnocactus gielsdorfianus</u> (Werderm.) Backeb.	b, CHRC, frp+, HNT+, KIEL, MCAR, rng, ZSS
<u>Gymnocactus knuthianus</u> (Boedeker) Backeb.	<u>HNT</u> , KALI, LE, MCAR, MHA, msk, NOVB, rigg, YOSH, ZSS
<u>Gymnocactus mandragora</u> (Fric) Backeb.	m, ZSS
<u>Gymnocactus saueri</u> (Boedeker) Backeb.	KWHA, LE, MCAR, NOVB, ZSS

<u>Gymnocactus subterraneus</u> (Backeb.)Backeb. var. <u>subterraneus</u>	ZSS
<u>Gymnocactus subterraneus</u> Backeb. var. <u>zaragosae</u> Glass & R.Foster	<u>HNT</u> , MCAR, <u>ZSS</u>
<u>Gymnocactus viereckii</u> (Werderm.) Backeb. var. <u>viereckii</u>	FRP, MEL, rng, <u>ZSS</u>
<u>Heliocereus schrankii</u> (Zucc.) Britton & Rose	<u>HNT+</u> , <u>K</u> , ZSS
<u>Heliocereus speciosus</u> (Cavan.) Britton & Rose var. <u>speciosus</u>	AA, b, br, frp, GOET, <u>HNT+</u> , KAZZ, LE, livc, rng+, wa, ZSS
<u>Heliocereus speciosus</u> (Cavan.) Britton & Rose var. <u>amecamensis</u> (Heese) Wein. ex A.Berger	b, GOET, HNT+, MCAR, rng+, ZSS
<u>Heliocereus speciosus</u> (Cavan.) Britton & Rose var. <u>superbus</u> (Ehrenbg.) A.Berger	UPS
<u>Leuchtenbergia principis</u> Hook.	AA, amd, B, BERN, BID, boch, BR, brist, CGG, CHIC+, CHRC, DBN, DUSS, e, frp, GOET, H, HNT, K, KAZZ, KIEL, KWHA, LE, LECB, m, MB, MCAR, MHA, mil, MO, msk, MW, NOVB, pac, RIGA, RIGG, rng, TEG, tim, tur+, UPS, YALT, YOSH, <u>ZSS</u>
<u>Mammillaria albicans</u> A.Berger	AA, BERN, BLAN, BR, H, KALI, KIEL, KWHA, LE, m, MCAR, MW, TUR+, YOSH, <u>ZSS</u>
<u>Mammillaria albicoma</u> Boedeker	BID, CHRC, frp, KALI, LE, MHA, MO, RIGA, RIGG, ZSS
<u>Mammillaria angelensis</u> R.T.Craig	GOET, MCAR, NCY, <u>ZSS</u>
<u>Mammillaria anniana</u> Glass & R.Foster	boch, frp, <u>HNT</u> , <u>ZSS</u>
<u>Mammillaria aureilanata</u> Backeb.	AA, boch, BR, HNT, rng, <u>ZSS</u>
<u>Mammillaria aurihamata</u> Boedeker	AA, AD+, BID, frp, hlu, kali, KIEL, KWHA, LE, MHA, mil, RIGA, RIGG, TK, YOSH, ZSS
<u>Mammillaria backebergiana</u> Buchenau	B, BID, CHRC, frp, GOET, HNT, <u>K</u> , KIEL, l, M, MCAR+, MO, NOVB, RIGA, <u>ZSS</u>

<u>Mammillaria baumii</u> Boedeker	AD, b, boch, BR, duss, frp, goet, KWAH, LE, LECB, M, mcar, MO, NCY, RIGA, rigg, rng, TEG, YALT, <u>ZSS</u>
<u>Mammillaria beiselii</u> Diers	FRP, <u>HNT</u> , m, <u>ZSS</u>
<u>Mammillaria blossfeldiana</u> Boedeker	AA, B, boch, BR, frp, GOET, <u>HNT</u> +, K, LE, m, MCAR, MO, NOVB, <u>RIGG</u> , YOSH, <u>ZSS</u>
<u>Mammillaria bombycina</u> Quehl	AA, ad+, B, BERN, BID, boch, BR, brist, CGG, CHRC, dbn, DTSK, frp, GBG, goet, HNT, K, kali, KHAR, KIEL, KPABG, KWAH, LE, LECB, LVC, m, mb, MCAR, mel, mil, MO, msk, MW, RIGA, <u>RIGG</u> , tall, TEG, TK, TUR+, u, ups, YALT, YOSH, <u>ZSS</u>
<u>Mammillaria boolii</u> G.Lindsay	BID, boch, frp+, GOET, <u>HNT</u> , KWAH, LE, LECB, m, MB, MIL, MO, NOVB, rigg, rng, YALT, YOSH, <u>ZSS</u>
<u>Mammillaria capensis</u> (H.Gates) R.T.Craig	B, <u>FRP</u> , GOET, NOVB, ORT, <u>ZSS</u>
<u>Mammillaria carmenae</u> Castaneda & Nunez	boch, DBN, GOET, HNT, KWAH, MCAR, MIL, MO, rng, TEG, <u>ZSS</u>
<u>Mammillaria carretii</u> Rebut	GOET, m, <u>MCAR</u> , TEG, <u>ZSS</u>
<u>Mammillaria cerralboa</u> (Britton & Rose) Orcutt	B, MCAR, <u>ZSS</u>
<u>Mammillaria coahuilensis</u> (Boedeker) Moran	hnt+, m, <u>ZSS</u>
<u>Mammillaria crucigera</u> Martius	B, CHIC, <u>FRP</u> , <u>GOET</u> , HNT, KALI, LECB, MB, MHA, RIGA, rng, TUR+, <u>ZSS</u>
<u>Mammillaria deherdtiana</u> Farwig var. <u>dodsonii</u> (H.Bravo) Glass & R.Foster	<u>ZSS</u>
<u>Mammillaria diguetii</u> (A.Weber) D.R.Hunt	AD+, UPS
<u>Mammillaria dixanthocentron</u> Backeb.	B, BERN, BID, BR, DUSS, frp, goet, K, KIEL, m, MB, MCAR+, NOVB, <u>ZSS</u>
<u>Mammillaria duoformis</u> R.T.Craig & E.Dawson	B, dtsk, <u>FRP</u> , GOET, <u>HNT</u> , MCAR, RIGA, <u>ZSS</u>
<u>Mammillaria erectacantha</u> Foerster	BID, <u>HNT</u> , <u>ZSS</u>

<u>Mammillaria evermanniana</u> (Britton & Rose) Orcutt	B, BID, BR, GOET, <u>HNT</u> , MCAR+, <u>ZSS</u>
<u>Mammillaria fittkaui</u> Glass & R.Foster	boch, frp, GOET, <u>HNT</u> , m, MO, ZSS
<u>Mammillaria gaumeri</u> (Britton & Rose) Orcutt	<u>B</u> , frp, GOET, m, MCAR, ZSS
<u>Mammillaria glassii</u> R.Foster var. <u>glassii</u>	B, FRP+, GBG, GOET, <u>HNT</u> , m, MB, MCAR, PRE, RNG+, ROT, TBI, TK, ZSS
<u>Mammillaria glassii</u> R.Foster var. <u>ascensionis</u> (Reppenhagen) Glass & R.Foster	GOET, <u>HNT</u> , mil, RIGA, RNG+, <u>ZSS</u>
<u>Mammillaria goodridgii</u> Scheer	AA, BR, dtsk, frp, <u>HNT</u> , MCAR, mil, rng, TEG, YALT, <u>ZSS</u>
<u>Mammillaria grusonii</u> Runge	B, BR, CHRC, dtsk, <u>FRP+</u> , <u>HNT</u> , KIEL, <u>ZSS</u>
<u>Mammillaria guelzowiana</u> Werderm.	<u>BERN</u> , BR, frp, goet, <u>HNT</u> , KIEL, LE, ORT+, rng, SVER, <u>ZSS</u>
<u>Mammillaria guerreronis</u> (H.Bravo) Backeb.	B, BERN, BID, DUSS, frp, goet, <u>HNT</u> , KIEL, MCAR, RIGA, TALL, u, <u>ZSS</u>
<u>Mammillaria hahniana</u> Werderm.	AA, ad+, amd, b, BERN, BID, BR, CGG, CHRC, DBN, DTSK, duss, frp, GBG, goet, HNT, KALI, KAZZ, KIEL, KIEV, KPABG, KWHA, l, LE, LECB, m, mb+, MCAR, mel, MHA, MIL, MO, msk, MTJB, MW, NCY, NOVB, OULU, RIGA, RIGG, rng, TEG, TUR+, UPS, wa, YALT, YOSH, ZSS
<u>Mammillaria halei</u> T.S.Brandege	B, <u>FRP</u> , K, <u>ZSS</u>
<u>Mammillaria heidiae</u> Krainz	MB, MCAR, MTJB, <u>XAL</u> , <u>ZSS</u>
<u>Mammillaria herrerae</u> Werderm.	AA, BR, chrc, GOET, kali, KWHA, LE, m, <u>MB</u> , MHA, NOVB, PRE, RIGA, rigg, rng, <u>ZSS</u>
<u>Mammillaria hertrichiana</u> R.T.Craig	amd, BR, <u>HNT</u> , MCAR, MW, ZSS
<u>Mammillaria huitzilopochtli</u> D.R.Hunt	M, MCAR, <u>ZSS</u>
<u>Mammillaria humboldtii</u> Ehrenb.	BR, GOET, <u>HNT</u> , K, KAZZ, KWHA, LE, mil, NOVB, rng, YALT, <u>ZSS</u>

<u>Mammillaria insularis</u> H.Gates	B, boch, BR, frp, GOET, <u>HNT</u> , LE, MB, MHA, msk, <u>ZSS</u>
<u>Mammillaria johnstonii</u> (Britton & Rose) Orcutt	B, BR, CHRC, E, FRP, GOET, <u>HNT</u> , <u>LE</u> , MCAR, mil, MTJB, NOVB, <u>ZSS</u>
<u>Mammillaria klissingiana</u> Boedeker	B, boch, frp, goet, <u>HNT</u> , k, LECB, MB, MCAR, MEL, mil, RIGG, ZSS
<u>Mammillaria knippeliana</u> Quehl	BR, <u>HNT</u> , m, ZSS
<u>Mammillaria kraehenbuehlII</u> Krainz	FRP, GOET, MCAR, <u>ZSS</u>
<u>Mammillaria laui</u> D.R.Hunt	frp, GOET, <u>HNT</u> , MCAR, <u>ZSS</u>
<u>Mammillaria lenta</u> K.Brandege	B, BID, frp, <u>HNT</u> , MCAR, <u>ZSS</u>
<u>Mammillaria lindsayi</u> R.T.Craig	<u>HNT</u> , MHA
<u>Mammillaria longiflora</u> (Britton & Rose) A.Berger	AA, duss, frp, goet, <u>HNT</u> , KIEL, LE, NCY, RIGA, rng, YALT, ZSS
<u>Mammillaria longimamma</u> G.Lindsay	AA, ad+, b, BATU, boch, br, DUSS, frp, <u>GOET</u> , <u>HNT</u> , <u>K</u> , KIEL, KWHA, LE, m, mil, MO, MW+, NCY, OULU, RIGA, RIGG, RNG, TBI, TEG, u, YALT, ZSS
<u>Mammillaria magnifica</u> Buchenau	AA, BID, CHRC, DUSS, FRP+, GOET, KIEL, livc, m, rng, TEG, ZSS
<u>Mammillaria maritima</u> G.Lindsay	B, ZSS
<u>Mammillaria marksiana</u> Krainz	ad+, amd, b, boch, BR, chrc, FRP+, GOET, <u>HNT</u> , KIEL, m, NOVB, <u>ZSS</u>
<u>Mammillaria mathildae</u> Krahenb. & Krainz	GOET, <u>HNT</u> , m, MCAR, MO, <u>ZSS</u>
<u>Mammillaria matudae</u> H.Bravo	B, BERN, boch, DUSS, FRP, GOET, <u>HNT</u> , m, MB, MCAR+, RIGA, TEG, ZSS
<u>Mammillaria melaleuca</u> Karw.	BR, frp, GOET, K, m, ZSS
<u>Mammillaria meyranii</u> H.Bravo	frp, GOET, <u>HNT</u> , RIGA, ZSS
<u>Mammillaria microhelia</u> Werderm.	amd, b, BID, boch, BR, CHRC, DTSK, DUSS, FRP, goet, H, HNT, kali, KAZZ, KIEL, KIEV, KPABG, KWHA, LE, LECB, m, MB+, MCAR+, mel, MHA, msk, MW, NOVB, OULU, RIGA, RIGG, TALL, TEG, TK, TUR+, YALT, YOSH, ZSS

<u>Mammillaria miegiana</u> Earle	frp, GOET, HNT, m, TEG, zss
<u>Mammillaria moelleriana</u> Boedeker	B, boch, BR, frp+, LE, m, MHA, MO, MW, NOVB, RIGA, TBI, YALT, <u>ZSS</u>
<u>Mammillaria multidigitata</u> G.Lindsay	B, BID, frp, HNT, m, MCAR+, MHA, mo, ZSS
<u>Mammillaria nana</u> Backeb.	AA, B, BID, boch, CHRC, dtsk, GOET, K, KWHA, LECB, MCAR+, NOVB, TEG, ZSS
<u>Mammillaria napina</u> J.A.Purpus	AA, KIEL, MHA, NOVB, TK, <u>ZSS</u>
<u>Mammillaria neopalmeri</u> R.T.Craig	BID, <u>HNT</u> , <u>ZSS</u>
<u>Mammillaria oteroi</u> Glass & R.Foster	<u>BERN</u> , <u>HNT</u> , mil, MO, msk, <u>ZSS</u>
<u>Mammillaria painteri</u> Rose	BR, DTSK+, FRP, m, MTJB, NCY, ZSS
<u>Mammillaria parkinsonii</u> Ehrenb.	AD+, b, BERN, BID, boch, BR, CHRC, E, frp, GBG, hlu, <u>HNT</u> , K, KIEL, LE, LECB, m, <u>MCAR</u> , mil, NCY, NOVB, RIGA, RIGG, TEG, TUR+, u, wa, YALT, ZSS
<u>Mammillaria pectinifera</u> A.Weber	AA, K, LE, RIGG, <u>RNG</u> , TUR+, ZSS
<u>Mammillaria peninsularis</u> (Britton & Rose) Orcutt	<u>FRP</u> , <u>HNT</u> , <u>ZSS</u>
<u>Mammillaria pennispinosa</u> Krainz var. <u>pennispinosa</u>	B, BR, <u>FRP</u> , GOET, KWHA, LE, m, MCAR, MO, rng, YALT, <u>ZSS</u>
<u>Mammillaria pennispinosa</u> Krainz var. <u>nazasensis</u> Glass & R.Foster	zss
<u>Mammillaria petrophila</u> K.Brandegee	FRP, <u>HNT</u> , M, ZSS
<u>Mammillaria pilispina</u> J.A.Purpus	BR, frp, LE, MB, MHA, RIGG, UPS, YOSH, ZSS
<u>Mammillaria pitcayensis</u> H.Bravo	B, BID, boch, BR, DUSS, frp, GOET, LIVC, MCAR, ZSS
<u>Mammillaria plumosa</u> A.Weber	AA, amd, b, BATU, bern, BID, boch, BR, CGG, chrc, DTSK, e, frp, goet, h, hlu, <u>HNT</u> , K, KIEL, KIEV, KPABG, KWHA, LE, LECB, LIVC, m, MB, MCAR, MEL, MHA, mil, mo, MTJB, NOVB, RIGA, RIGG, rng, SWSD, TK, <u>XAL</u> , YALT, YOSH, ZSS

<u>Mammillaria pondii</u> Greene	B, boch, <u>HNT</u> , <u>ZSS</u>
<u>Mammillaria reppenhagenii</u> D.R.Hunt	<u>ZSS</u>
<u>Mammillaria rettigiana</u> Boedeker	boch, GOET, KWAH, MCAR, MTJB, NOVB, ORT+, RIGA, RIGG, <u>ZSS</u>
<u>Mammillaria roseoalba</u> Boedeker	B, BID, DBN+, frp, KIEL, KWAH, m, MHA, NCY, RIGA, SVER, UPS, <u>ZSS</u>
<u>Mammillaria rubrograndis</u> Lau & Reppenhagen	FRP, <u>HNT</u> , <u>ZSS</u>
<u>Mammillaria saboae</u> Glass var. <u>saboae</u>	frp, GOET, <u>HNT</u> , KAZZ, KWAH, LE, m, MB, rng, SVER, TK, YOSH, <u>ZSS</u>
<u>Mammillaria saboae</u> Glass var. <u>goldii</u> Glass & R.Foster	<u>HNT</u> , rng, YALT, <u>ZSS</u>
<u>Mammillaria san-angelensis</u> Sanchez-Mej.	KWAH
<u>Mammillaria schiedeana</u> Ehrenb. var. <u>schiedeana</u>	AA, B, BID, BR, brist, frp, GBG, KIEL, LE, M, MCAR, mil, NCY, RIGA, rng, TEG, YALT, <u>ZSS</u>
<u>Mammillaria schiedeana</u> Ehrenb. var. <u>dumetorum</u> (J.A.Purpus) Glass & R.Foster	<u>GOET</u> , <u>ZSS</u>
<u>Mammillaria schwarzii</u> Shurly	AA, ad+, boch, BR, DTSK, frp, goet, K, KHAR, KIEL, KWAH, MHA, msk, RIGA, rng, SWSD, YALT, YOSH, <u>ZSS</u>
<u>Mammillaria setispina</u> Coulter	AA, B, <u>BERN</u> , boch, <u>FRP</u> , <u>HNT</u> , KWAH, m, UPS, <u>ZSS</u>
<u>Mammillaria slevinii</u> (Britton & Rose) Boedeker	<u>HNT</u> , MCAR, <u>ZSS</u>
<u>Mammillaria solisioides</u> Backeb.	BR, KWAH, LE, NCY, SWSD, <u>ZSS</u>
<u>Mammillaria stella-de-tacubaya</u> Heese	<u>ZSS</u>
<u>Mammillaria supertexta</u> C.Martius	BID, BR, <u>K</u> , KIEL, KWAH, tim, <u>ZSS</u>
<u>Mammillaria surculosa</u> Boedeker	b, BATU, boch, BR, CHRC, frp, goet, KWAH, LE, m, MCAR, MEL, MO, MW+, RIGA, rigg, u, UPS, YALT, <u>ZSS</u>
<u>Mammillaria swinglei</u> (Britton & Rose) Boedeker	boch, BR, dtsk, frp, KAZZ, KWAH, m, MB, NOVB, RIGG, YALT, <u>ZSS</u>

<u>Mammillaria tayloriorum</u> Glass & R.Foster	frp, m, ZSS
<u>Mammillaria theresae</u> Cutak	B, BR, GBG, GOET, <u>HNT</u> , KWAH, LE, MO, msk, NOVB, RIGA, rng, YALT, <u>ZSS</u>
<u>Mammillaria tonalensis</u> D.R.Hunt	<u>HNT</u> , <u>ZSS</u>
<u>Mammillaria varieaculeata</u> Buchenau	<u>HNT</u> , <u>ZSS</u>
<u>Mammillaria weingartiana</u> Boedeker	<u>HNT</u> , <u>MB</u> , ZSS
<u>Mammillaria wiesingeri</u> Boedeker	BERN, BID, frp, <u>HNT</u> , KALI, KIEL, KWAH, LE, LECB, NCY, NOVB, RIGA, RIGG, SVER, TUR+, YOSH, ZSS
<u>Mammillaria xaltiangensis</u> Sanchez-Mej.	MCAR, ZSS
<u>Mammillaria yaquensis</u> R.T.Craig	b, frp, m, MCAR, RIGA, rng+, TUR+, YALT, ZSS
<u>Mammillaria yucatanensis</u> (Britton & Rose) Orcutt	duss, HNT, m, MCAR, MW+, RIGA
<u>Mammillaria zeilmanniana</u> Boedeker	amd, BID, boch, BR, CHRC, frp, goet, H, HNT, kali, KIEL, KWAH, LE, LIVC, mb, mcar, MHA, mil, MO, msk, mtjb, NOVB, RIGA, rigg, TALL, TEG, TUR+, UPS, ZSS
<u>Mammillaria zephyranthoides</u> Scheidw.	ad+, frp, M, rng, ZSS
<u>Mammillaria zeyeriana</u> W.Haage	boch, DTSK, frp, <u>HNT</u> , KIEL, MCAR, MTJB, NOVB, ZSS
<u>Melocactus curvispinus</u> Pfeiffer	MO, TBI
<u>Melocactus dawsonii</u> H.Bravo	<u>HNT</u> , ZSS
<u>Melocactus delessertianus</u> Lemaire	K, LE, MCAR, <u>XAL</u> , ZSS
<u>Melocactus oaxacensis</u> (Britton & Rose) Backeb.	dtsk, K, MCAR, UPS, ZSS
<u>Morangaya pensilis</u> (K.Brandege) G.Rowley	ad+, B, BR, <u>HNT</u> +, rng, ZSS
<u>Neobuxbaumia euphorbioides</u> (Haw.) F.Buxb.	AA, AD+, amd, B, BID, boch, BR, dbn, frp, GBG, HNT, KAZZ, KIEL, LE, LIVC, m, MO, msk, NCY, ort, RIGA, TUR+, u, YOSH, ZSS

<u>Neobuxbaumia macrocephala</u> (A.Weber) Dawson	b, TALL
<u>Neobuxbaumia polylopha</u> (DC.) Backeb.	amd, b, BERN, BID, BLAN+, boch, BR, cgg, chic, DTSK, DUSS, E, frp, goet, H, HNT, K, KIEL, KWHA, LE, LECB, livc, m, mcar+, mil, MO, mtjb, MW, ORT+, PRE, RIGA, rng, TUR+, u+, YALT, ZSS
<u>Nopalxochia ackermannii</u> (Haw.) Knuth var. <u>ackermannii</u>	AD+, <u>B</u> , BR, <u>HNT</u> +, LE, NCY, ZSS
<u>Nopalxochia ackermannii</u> (Haw.) Knuth var. <u>conzattianum</u> (T.M.Macdoug.) Kinnach	<u>HNT</u>
<u>Nopalxochia maddougallii</u> (Alexander) W.Marshall	<u>HNT</u>
<u>Nopalxochia phyllanthoides</u> (DC.) Britton & Rose	b, BR, DUSS, GBG, <u>HNT</u> +, K, KIEL, KPABG, LE, mil, MTJB, NCY, RIGA, RIGG, rng, u, ZSS
<u>Obregonia denegrii</u> Fric	B, BID, boch, BR, frp, goet, HNT, KAZZ, KIEL, LE, LECB, M, MCAR, MO, msk, NOVB, RIGG, rng, rot, TEG, YALT, YOSH, <u>ZSS</u>
<u>Opuntia agglomerata</u> A.Berger	tim
<u>Opuntia crystalenia</u> Griffiths	BR, MTJB
<u>Opuntia depressa</u> Rose	mil
<u>Opuntia dumetorum</u> A.Berger	frp
<u>Opuntia fuliginosa</u> Griffiths	HNT+, KWHA, ORT
<u>Opuntia glaucescens</u> Salm-Dyck	amd, br, E, KIEL
<u>Opuntia grandis</u> Pfeiffer	BR, dbn+, HNT+, KPABG, ort, RIGG
<u>Opuntia guilanchi</u> Griffiths	HNT+
<u>Opuntia howeyi</u> J.A.Purpus	frp, mtjb
<u>Opuntia huajuapensis</u> H.Bravo	frp
<u>Opuntia lasiacantha</u> Pfeiffer	b, boch, KIEL, u
<u>Opuntia leptocaulis</u> DC. var. <u>badia</u> A.Berger	BATU, BLAN

<u>Opuntia leptocaulis</u> DC. var. <u>brittonii</u> (G.Ortega) Bravo	TBI
<u>Opuntia lubrica</u> Griffiths var. <u>lubrica</u>	b, livc, mcar, TUR
<u>Opuntia microdasys</u> (J.Lehm.) Pfeiffer var. <u>albispina</u> Fobe	AA, ad+, amd, b, BATU, BID, blan, BR, CHRC, dtsk, E, GBG, HNT+, K, KALI, KAZZ, KIEL, KPABG, KWHA, LE, livc, m, mb+, mcar, MHA, mil, MO, msk, MW+, NOVB+, ort, oulu, pav, RIGA, RIGG, SVER, tall, TUR+, u, UPS, wa, YALT, ZSS
<u>Opuntia puberula</u> Pfeiffer	brist, frp, k, KIEL, livc, <u>XAL</u>
<u>Opuntia rosarica</u> Lindsay	<u>HNT+</u>
<u>Opuntia santamaria</u> (Baxter) H.Bravo	frp
<u>Opuntia stenopetala</u> Engelm. var. <u>inermis</u> H.Bravo	<u>MTJB</u>
<u>Ortegocactus macdougallii</u> Alex.	boch, BR, DBN, frp, GOET, LE, msk, rng, <u>ZSS</u>
<u>Pelecyphora aselliformis</u> Ehrenb.	amd, B, BID, BR, frp, goet, <u>HNT</u> , K, KIEL, KWHA, LE, m, MB, MHA, MIL, MO, NOVB, rng, TUR+, YALT, <u>ZSS</u>
<u>Pelecyphora strobiliiformis</u> (Werderm.) Fric & Schelle	HNT, KIEL, m, rng, TUR+, <u>XAL</u> , <u>ZSS</u>
<u>Peniocereus fosterianus</u> Cutak var. <u>fosterianus</u>	b, <u>HNT+</u> , livc, m, u, ZSS
<u>Peniocereus maculatus</u> (Wein.) Cutak	b, HNT+, MCAR, ZSS
<u>Peniocereus marianus</u> (Gentry) Sanchez-Mej.	<u>HNT+</u> , MCAR
<u>Peniocereus rosei</u> G.Ort.	b, BID, BR, <u>HNT+</u> , rng, TUR+, ZSS
<u>Pereskia lychnidiflorus</u> DC.	<u>B+</u> , DTSK, <u>HNT+</u>
<u>Selenicereus atropilosus</u> Kimnach	<u>B</u> , <u>HNT+</u> , TBI, ZSS
<u>Selenicereus hamatus</u> (Scheidw.) Britton & Rose	AD+, b, BATU, boch, br, CHRC, duss, E, gbg, hlu, HNT+, KAZZ, KIEL, LE, m, msk, NOVB, tall, TBI, u, UPS, YOSH, ZSS

<u>Selenicereus nelsonii</u> (Wein.) Britton & Rose	AD+, amd, b, BID, BR, KALI, LE, MB+, MCAR, MHA, NCY, NOVB, RIGA, SVER, TALL
<u>Stenocactus boedekerianus</u> A.Berger	rigg
<u>Stenocereus eruca</u> (K.Brandege) Gibson & Horak	<u>B</u> , BR, <u>FRP</u> , <u>HNT</u> , m, rng, <u>ZSS</u>
<u>Stenocereus martinezii</u> (G.Ortega) H.Bravo	BID, <u>FRP</u> , <u>HNT</u> , rigg
<u>Strombocactus disciformis</u> (DC.) Britton & Rose	boch, BR, goet, <u>HNT</u> , KAZZ, KWHA, LE, LECB, m, <u>MB</u> , MHA, msk, rng, TBI, TEG, TK, <u>TUR+</u> , UPS, YOSH, <u>ZSS</u>
<u>Thelocactus krainzianus</u> Oehme	frp, KWHA
<u>Thelocactus macdowellii</u> (Rebut ex Quehl) W.Marshall	B, goet, <u>HNT</u> , LE, RIGA, rigg, wa, ZSS
<u>Thelocactus matudae</u> Sanchez-Mej. & A.Lau	AA, FRP, <u>ZSS</u>
<u>Turbinicarpus laui</u> Glass & R.Foster	HNT, MCAR, <u>ZSS</u>
<u>Turbinicarpus lophophoroides</u> (Werderm.) F.Buxb. & Backeb.	BID, boch, BR, dtsk, goet, HNT, KWHA, LE, m, MCAR, MHA, MO, msk, MW, NOVB, RIGA, rigg, rng, TK, YALT, YOSH, <u>ZSS</u>
<u>Turbinicarpus pseudomacrochele</u> (Backeb.) F.Buxb. & Backeb. var. <u>pseudomacrochele</u>	BID, BR, GBG, goet, KIEL, KWHA, LE, m, MCAR, rng, TBI, <u>ZSS</u>
<u>Turbinicarpus pseudomacrochele</u> (Backeb.) F.Buxb. & Backeb. var. <u>krainzianus</u> (G.Frank) Glass & R.Foster	goet, KWHA, rng, SWSD, YALT, <u>ZSS</u>
<u>Turbinicarpus pseudopectinatus</u> (Backeb.) Glass & R.Foster	amd, <u>B</u> , boch, BR, rng, ZSS
<u>Turbinicarpus schmiedickeanus</u> (Boedeker) F.Buxb. var. <u>schmiedickeanus</u>	FRP, <u>HNT</u> , LE, MCAR, rigg, rng, <u>ZSS</u>
<u>Turbinicarpus schmiedickeanus</u> (Boedeker) F.Buxb. & Backeb. var. <u>flaviflorus</u> (G.Frank) Glass & R.Foster	GOET, HNT, rigg, <u>ZSS</u>

<u>Turbinicarpus schmiedickeanus</u> F.Buxb. & Backeb. var. <u>gracilis</u> Glass & R.Foster	BID, <u>ZSS</u>
<u>Turbinicarpus schmiedickeanus</u> F.Buxb. & Backeb. var. <u>klinkerianus</u> Glass & R.Foster	B, boch, BR, GOET, HNT, LE, OULU, YALT, <u>ZSS</u>
<u>Turbinicarpus schmiedickeanus</u> (Boedeker) F.Buxb. & Backeb. var. <u>macrochele</u> (Werderm.) Glass & R.Foster	B, BR, GOET, LE, rng, YALT, <u>ZSS</u>
<u>Turbinicarpus schmiedickeanus</u> (Boedeker) F.Buxb. & Backeb. var. <u>schwarzii</u> (Shurly) Glass & R.Foster	B, boch, BR, GOET, livc, riga, rng, SWSD, wa, yalt, ZSS
<u>Turbinicarpus valdezianus</u> (Moeller) Glass & R.Foster	<u>B</u> , HNT, KWHA, LE, MTJB, rng, YALT, <u>ZSS</u>
<u>Werckleocereus glaber</u> Britton & Rose var. <u>mirandae</u> (H.Bravo) Kimnach	<u>HNT</u> +, ZSS
<u>Wilcoxia albiflora</u> Backeb.	AA, B, DBN, DTSK, frp, goet, <u>HNT</u> +, KIEV, KWHA, LE, MB+, MCAR, MHA, msk, MW+, RIGA, YALT, ZSS
<u>Wilcoxia papillosa</u> Britton & Rose	CHRC, KWHA, MCAR

INDEX OF CODES

CODE

INSTITUTION

AA	Main Botanical Garden of Kazakh Ac. of Sciences, ALMA-ATA 70, Kazakh SSR, U.S.S.R.
AD	Adelaide Botanic Garden, North Terrace, ADELAIDE, S. Australia 5000.
AMD	Hortus Botanicus of the University of Amsterdam, Plantage Middenlaan 2, 1018 DD AMSTERDAM, The Netherlands.
B	Botanischer Garten Berlin-Dahlem, Königin-Luise-Strasse 6-8, D-1000 BERLIN 33, Federal Republic of Germany.
BATU	Batumi Botanical Garden, Georgian Academy of Sciences, BATUMI, Machindzauri, Georgia, U.S.S.R.
BERN	Botanischer Garten der Universität, Altenbergrain 21, CH-3013 BERN, Switzerland.
BID	Fleverhof Biddinghuizen, c/o Department of Plant Taxonomy, Agricultural University, 37 Generaal Foulkesweg P.O. Box 8010, 6700ED WAGENINGEN, The Netherlands.
BLAN	Jardin Botanico Marimurta, Fundacion Carlos Faust, Estacion Int. de Biologia Mediterranea, BLANES, Provincia Gerona, Spain.
BOCH	Botanischer Garten Ruhr-Universität, Postfach 102148, D-4630 BOCHUM 1, Federal Republic of Germany.
BR	Jardin Botanique National de Belgique, Domaine de Bouchout, B-1860 MEISE, Belgium.
BRES	Conservatoire Botanique de Stangelarc'h, 29200 BREST, France.
BRIST	University of Bristol Botanic Garden, Department of Botany, Woodland Road, BRISTOL BS8 1UG
CGG	Cambridge University Botanic Garden, 1 Brookside, CAMBRIDGE CB2 1JF, U.K.
CHIC	Chicago Botanic Garden, P.O. Box 400, GLENCOE, Illinois 60022, U.S.A.
CHRC	Christchurch Botanic Gardens, Parks and Recreations Department, City Council, P.O. Box 237, CHRISTCHURCH, New Zealand.
DBN	National Botanic Gardens, Glasnevin, DUBLIN 9, Ireland.
DTSK	Donetsk Botanical Garden, Elevatornaya Street 19, 340079 DONESTK 3, U.S.S.R.
DUSS	Botanischer Garten der Universität Dusseldorf, Universitätstrasse 1, D-4000 DUSSELDORF 1, Federal Republic of Germany.
E	Royal Botanic Garden, Inverleith Row, EDINBURGH EH3 5LR, U.K.

FRP	Palmengarten der Stadt Frankfurt, Siesmayerstrasse 61, 6000 FRANKFURT AM MAIN-1, Federal Republic of Germany.
GBG	Glasgow Botanic Gardens, GLASGOW G12 0UE, U.K.
GOET	Alter Botanischer Garten der Universität, Untere Karspule 1, D-3400, GOTTINGEN, Federal Republic of Germany.
H	Botanical Gardens of the University, Unionkatu 44, 00170 HELSINKI 17, Finland.
HLU	University of Hull Botanic & Experimental Garden, Department of Plant Biology, University of Hull, HULL HU6 7RX U.K.
HNT	Huntington Botanical Gardens, 1151 Oxford Road, SAN MARINO, California 91108, U.S.A.
K	Royal Botanic Gardens, Kew, RICHMOND, Surrey TW9 3AB, U.K.
KALI	Botanical Garden of the State University, Belomorskaya Street 20, 236019 KALININGRAD, U.S.S.R.
KAZZ	Kazan Zoobotanic Garden, Khadi Taktash Street 112, KAZAN 41, Tatar Autonomous Republic, U.S.S.R.
KHAR	Botanical Garden of the Kharkov State University, Klochkovskaya 52, 310022 KHARKOV, U.S.S.R.
KIEL	Botanischer Garten der Universität Kiel, Olshausenstrasse 40-60, Biologiezentrum, D-2300 KIEL, Federal Republic of Germany.
KIEV	Botanical Garden of the State University, Komintern Street 1, 252032 KIEV 32, Ukraine, U.S.S.R.
KPABG	Polar-Alpine Botanic Garden, 184230 KIROVSK 2, Murmansk Region, U.S.S.R.
KWHA	Central Republic Botanic Garden, Timiryazevskaya Street 1, 252014 KIEV 14, Ukraine, U.S.S.R.
L	Leiden University Botanic Garden, Nonnensteeg 3, 2311 VJ LEIDEN, The Netherlands.
LAU	Jardin Botanique de Lausanne, 14 bis, Avenue de Cour, CH-1007 LAUSANNE, Switzerland.
LE	Botanical Garden, Komarov Botanical Institute, Professor Popov Street 2, 197022 LENINGRAD 22, U.S.S.R.
LECB	Botanical Garden, Leningrad State University, Universitetskaia nab. 7-9, 199164 LENINGRAD B-164, U.S.S.R.

LIVC	Liverpool City Botanic Gardens, The Mansion House, Calderstones Park, LIVERPOOL L18 3JD, U.K.
M	Munich Botanic Garden, Menzingerstrasse 63-67, 8000 MUNCHEN, Federal Republic of Germany.
MB	Botanischer Garten der Philipps-Universität, Auf den Lahnbergen, 3550 MARBURG, Federal Republic of Germany.
MCAR	Jardin Exotique de Monaco, B.P. 105 MONTE CARLO, MC. 98000 Monaco.
MEL	Royal Botanic Gardens of Melbourne, Birdwood Avenue, SOUTH YARRA, Victoria 3141, Australia.
MHA	Main Botanic Garden, The Herbarium, Academy of Sciences, MOSCOW U-276 U.S.S.R.
MIL	Mitchell Park Conservatory, 524 South Layton Boulevard, MILWAUKEE Wisconsin 53215 U.S.A.
MO	Missouri Botanical Garden, P.O. Box 299, St Louis, MISSOURI 63166, U.S.A.
MSK	Central Botanical Garden of the Academy of Sciences, 2a Surganova Street, 220072 MINSK 72, Byelorussia, U.S.S.R.
MTJB	Jardin Botanique de Montreal, 4101 Est, Rue Sherbrooke, MONTREAL, Quebec H1X 2B2, Canada.
MW	Botanical Garden, Moscow Lomonosov State Univ., MOSCOW V-234, U.S.S.R.
NCY	Jardins Botaniques de Nancy, 100, rue du Jardin Botanique, F-54600, VILLERS-LES-NANCY, France.
NIJ	University Botanic Garden, Department of Botany, Toernooiveld, NIJMEGEN, The Netherlands.
NOVB	Siberian Central Botanical Garden, Zolotodolinskya 101, 630090 NOVOSIBIRSK 90, U.S.S.R.
ORT	Jardin de Aclimatacion de La Orotava, Puerto de la Cruz, TENERIFE, Canary Islands, Spain.
OULU	Botanical Garden, Department of Botany, University of Oulu, Box 191, SF-90101 OULU 10, Finland
PAC	The Buckhout Greenhouse, 202 Buckhout Laboratory, Department of Biology, The Pennsylvania State University, Pennsylvania 16802, U.S.A.
PAV	Istituto et Orto Botanico dell Università de Pavia, Via San Epifanio 14, 27100 PAVIA, Italy.

PRE	Pretoria National Botanic Garden, Dept. of Agricultural Technical Services Botanical Research Institute, Private Bag X101, PRETORIA, South Africa 001.
RIGA	Botanical Garden, Latvian Academy of Sciences, 229021 Riga P.O. SALASPILS, Latvia, U.S.S.R.
RIGG	Botanical Garden, Latvian State University, L. Kandavas Street 2, 226007 RIGA 7, Latvia, U.S.S.R.
RNG	Plant Science Botanic Garden, Plant Science Laboratories, University of Reading, Whiteknights, READING RG6 2AS, U.K.
ROT	Arboretum Trompenburg, Groene Wetering 46, 3062 PC ROTTERDAM, The Netherlands.
SVER	Botanical Garden, Sverdlovsk Institute of Ecology, 8 March Street 202, 620008 SVERDLOVSK 8, U.S.S.R.
SWSD	Sea World Inc., 1720 South Shores Road, Mission Bay, San Diego, California 92109, U.S.A.
TALL	Botanical Garden, Tallinn Academy of Sciences, Kloostrimetsa Street 44, 200019 TALLINN, Estonia, U.S.S.R.
TBI	Tbilisi Central Botanical Garden, 380005, TBILISI PO5, Georgia, U.S.S.R.
TCD	Trinity College Botanic Garden, School of Botany, Trinity College, DUBLIN 2, Ireland.
TEG	Jochum-Hof, Maashoek 2b, STEYL, Gem. Tegelen, The Netherlands.
TIM	Timaru Botanic Garden, Parks and Recreation Department, City Council, P.O. Box 522, TIMARU, New Zealand.
TK	Siberian Botanic Garden, Tomsk State University, V.V. Kuibsheva, Lenin Avenue 36, TOMSK, U.S.S.R.
TUR	University of Turku Botanical Garden, SF-20500 TURKU 50, Finland.
U	State University Botanical Gardens, Harvardlaan 2, Postbus 80-162, 3508 TD - UTRECHT, The Netherlands.
UPS	Uppsala Botanic Garden, Villavagen 8, S-75236 UPPSALA, Sweden.
WA	Warsaw University Botanic Garden, Al. Ujazdowskie 4, 00-478 WARSAW, Poland.
WAG	Belmonte Arboretum and Botanical Gardens, Agricultural University, Generaal Foulkesweg 37, 6703 BL WAGENINGEN, The Netherlands.

- XAL Jardin Botanico Fco. J. Clavijero, INIREB, Apartado Postal 63, XALAPA,
Veracruz, Mexico.
- YALT State Nikita Botanical Gardens, YALTA, Crimea, Ukraine, U.S.S.R.
- YOSH Dendrarium of the Maryiski Polytechnic Institute, Sovietskaya Street 152,
424024, YOSHKAR-OLA, U.S.S.R.
- ZSS Stadtische Sukkulentsammlung Zurich, Mythenquai 88, 8002 ZURICH,
Switzerland.

